STEEL

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CONTENTS

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THE YEAR IN PERSPECTIVE 55

THE STEEL INDUSTRY—WHAT OF ITS FUTURE? 57
Where Finished Steel Went in 1932 62
Alloy Steel Will Win New Markets 65
Rehabilitation Will Be Keynote in 1933 67
Business Recovery to Gage Roosevelt Administration 71
Capital "Buried" in Heavy Raw Material Reserves? 74
Steel Companies Consider Relinquishing Coal Mines 74
Taxes Grind Iron Ore Industry; Minnesota Refuses Relief 75

THE BUSINESS TREND 77
EDITORIAL—Important Objectives for 1933 78

World Output Back to Start of Century 82
Digest of Engineering Progress for 1932 85
Markets Plumb New Lows for 1932, but Fall Rally Heartens 101
Average Monthly Domestic Metal Prices for 1932 104
Iron, Steel, Allied Prices, Monthly Averages for Years 105
Steel Ingot Production Statistics for Years 122
Pig Iron Production Statistics for Years 123
Compcsite Market Price Record for Years 124
Current Steel Market Reports 125
November Exports, Imports Rise to May Level 147
Personals 148
Obituaries 149
Reviews of Foreign Markets for 1932 153

WHERE-TO-BUY DEPARTMENT 169
ADVERTISERS' INDEX 188

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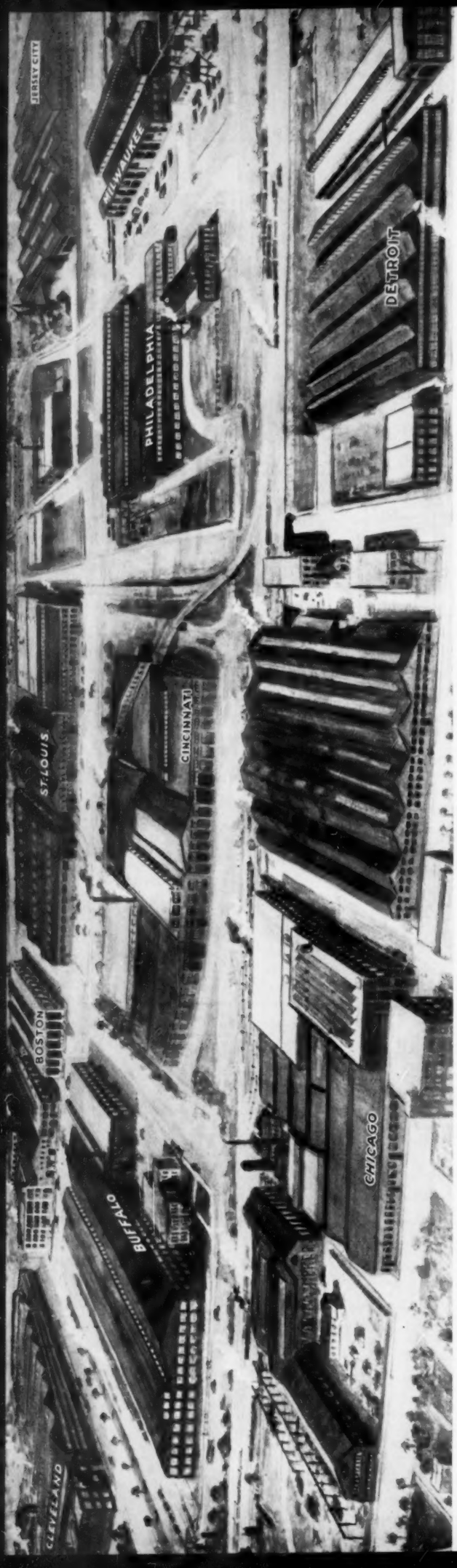

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Volume 92 Number 1

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Year in Perspective

COLUMBIA may be the gem of the ocean, but Britannia rules the open hearths! Lacking automobiles, tall structures, food packing, heavy railroad equipment and long-distance pipelines on the scale that the United States knows these major outlets for steel, Great Britain in 1932 nevertheless consumed more steel per capita—249 pounds—than the United States—242 pounds. This reversal is predicated upon a world production of 49,160,000 tons of ingots and castings, 28 per cent less than in 1931. To this total the United States contributed 13,500,000 tons, a decline of 47 per cent and indicating that the pendulum had swung as far back in reaction as it went forward in 1929, and Great Britain 5,240,000 tons, an increase of 1 per cent.

Hope Recovery, Like Empire, Trends Westward

BUT Great Britain was not alone in improving her position and perhaps turning the corner. Russia, Japan, Italy also made more steel than in 1931, while in Belgium, the Saar, Italy, Spain, Sweden, India the ebb was negligible. . . . This convalescence abroad, the intensity of liquidation at home and a fall rally, albeit short-lived, aroused hope that recovery nears and lightened an otherwise drab year—a year in which freight car orders fell to the incredibly low level of 1700 units, automobile assemblies to 1,375,000 vehicles and structural steel awards to 845,000 tons. It was inevitable that output of coke pig iron recede to 8,710,000 tons and ingots and castings to 13,500,000 tons, lowest in 36 and 30 years.

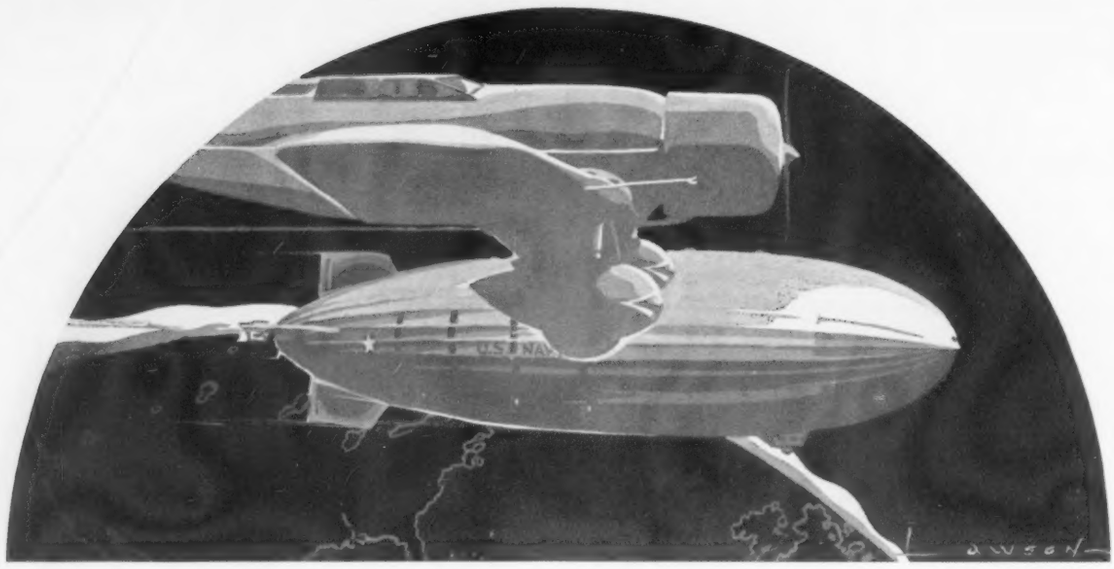
Need Midas-touch To Pay Iron Ore Taxes

PRICES not having scaled the heights in 1929, their descent was not precipitate, being from $31.15 in 1931 to $29.46 in 1932, as measured by STEEL's composite, but on the toboggan with production were profits and wages. The effect of a 47 per cent curtailment in output and a 5 per cent decline in price was a loss which averaged $7.72 per ton of ingots in the first quarter, $13.78 in the second, $17.53 in the third, perhaps still greater in the fourth. . . . Even a 15 per cent cut in wage rates in May, with a comparable adjustment in salaries and personnel, was not mitigating. . . . These deficits were accentuated by excessive taxation, levies on iron ore in Minnesota for example exceeding the market value of pig iron smelted from 1932 shipments. . . . There was talk of jettisoning some of the industry's coal reserves.

Autos Lead Steel Use; Containers Move Up

Attenuated as automobile production was in 1932, by comparison it was sufficiently virile to become the premier consumer of steel, ousting the building industry. Another upset was the maturing of the container industry into a major consumer. By percentages, the con-

Steel's cauldron boils over! Slag being recovered in cinder thimbles near the end of the tap of an open-hearth furnace. Photograph by Walter Bartz, of Youngstown Sheet & Tube Co.



sumption of finished rolled steel in 1932 was: Automotive, 18.15; buildings, 16.38; containers, 10.79; railroads, 9.09; oil, gas and water, 5.50; machinery, 3.39; exports, 3.31; all other, 33.39.

Efficiency, Not Capacity, Objective in 1932

SENSITIVE to the times, the trend in construction and rehabilitation in iron and steel was toward increasing the productivity of labor, to reduce costs. During the year no blast furnaces were completed or begun, and only three remodeled. In open-hearth steel furnaces and bessemer converters there was no activity whatsoever. Only 138 by-product coke ovens were brought in, and none was initiated. However, 21 rolling mills were completed, 15 being 4-high hot or cold strip mills with a total of 44 stands of rolls, and 14 were projected. . . . Also responsive to new conditions was the American Iron and Steel institute, which under quickened leadership became spokesman for the industry and waged war on dumping.

Put Flexibility, Adaptability in Equipment

TECHNICAL developments in 1932 also were aimed at costs, and the tendency in equipment design and improvements was toward flexibility and adaptability rather than a high degree of automaticity or fixed purpose efficiency. . . . Blast furnaces were blown or banked, almost with the ease of open-hearth operation. . . . Revolutionary in character was a new mill for making small-diameter, hot, seamless tubing . . . . Automatic processes and greater resort to press forging were advances in the forging industry. . . . Stainless steel was line-welded successfully, and oxy-acetylene torch flame machining adapted semi-commercially. . . . Heat treating progressed as there was more general utilization of gas carburizing, and controlled atmospheres were applied to more furnaces . . . . Foundries offered higher quality castings at lower prices. . . . Refractory manufacturers built longer life and higher strength into their products. . . . In machine tools, greater rigidity and flexibility were stressed. . . . Houses with porcelain enamel exteriors became a reality.

U. S. Steel Leads in Personnel Changes

OWING to the 70-year age limit or anticipating it, J. A. Farrell, E. J. Buffington, J. S. Keefe and A. T. deForest resigned Steel corporation presidencies during the year, and D. G. Kerr and T. W. Robinson vice presidencies. New presidents of subsidiaries include G. G. Thorp of Illinois, C. F. Blackmer of American Steel & Wire, A. N. Diehl of Columbia, J. W. Seens of Canadian Steel. Others advancing within the Steel corporation were Myron C. Taylor, W. J. Filbert, C. S. Belsterling, Robert Gregg, John A. Coakley, Edwin E. Ellis, C. L. Wood, E. H. Heald, R. E. Zimmerman, James R. Mills. . . . James A. Campbell severed his active connection with the industry. . . . Donald B. Gillies became president of Corrigan, McKinney and Newton. . . . F. B. Hufnagel assumed the presidency of Pittsburgh Crucible. . . . W. H. Stewart took over Pacific Coast Steel, Col. J. S. Ervin Mackintosh-Hemphill, Henry F. Devens Oliver Iron & Steel.

More Young Than Old Executives Pass

THROUGH death, such distinguished names as Julian Kennedy, Donald M. Ryerson, Donald M. Eddy, Gilbert Fellansbee, Merle A. Mesta, Arthur L. Davis, Tinius Olsen, Hugh P. Tiemann, Morris W. Bush, J. T. Moltrup, Robert M. Keeney, Col. E. H. Williams, Richard Garlick, John T. Harrington, A. B. Wolvin, Percival Chrystie, William T. Graham, Col. C. C. Smith, Frank C. Case, John C. Cromwell, A. L. Cromlish, were stricken from the rolls.

The Steel Industry—What of Its Future?

By E. L. SHANER
Editor of STEEL

PRODUCTION of iron and steel at levels lowest since the nineteenth century has given rise in certain quarters to doubt about the future of the steel industry. It is argued by some observers that the era of great opportunity, as exemplified by the first quarter of the present century, has run its course and that the steel industry is doomed to a long period of hard times.

Except for two major factors, namely the influence of the present depression and the leveling off in the growth of population of the United States, we can see no basis for predictions that steel's future will be any less favorable than in the past.

As for the depression itself, have we any grounds for believing that its after-effect will be any different from that of 1893? In the gloomy days of the nineties, statements were made that the country had grown up, that the days of golden opportunity in a young empire were past and that industry would have to accustom itself to a long period of lean business. Yet in spite of these predictions, the United States from 1896, when price levels reached their lowest point in the decline from the Civil war, to 1929, enjoyed a period of development unequaled in the world's history.

Future Looked Dark in Nineties

As a matter of speculation, is it not reasonable to assume that at the present time, with prices at the levels of the late nineties, we are in a position comparable to that of 1896? Can we not believe that the world is adjusting itself to the effects of the World war more quickly than this country righted itself after the Civil war? Perhaps we are accomplishing in the dozen years from 1920 to 1932 or 1933 the changes which in our previous major war adjustment required the 30 years from 1866 to 1896.

If this assumption is sound, then industry now is facing another period of great opportunity. A young man entering business today can look forward to a future not unlike that his father contemplated when he started his career shortly before the turn of the century. On the basis of this reasoning, who can say that the future of this country or of this industry is sterile of opportunity?

As for the point that the population of the United States is approaching a state of stabilization, it must be admitted that this fact will

Luxury in 1900 and earlier! But this nation will not return to standards of the horse and buggy days

The Steel Industry— . . . . . .

This country has been built up by men of Vision, Courage and Initiative

influence the future of the steel industry. But this influence usually is overrated because those who fear its effect most also believe that the country is fully developed. Combining the factors of a slower rate in growth of population and the fallacious idea that the nation needs no further development, they conclude that future demand for a material as basic as steel cannot again rise to levels of the past.

In meeting this argument two facts must be kept in mind: First, population still is increasing, but at a declining rate, and secondly, the United States may be fully or overdeveloped in certain respects but it still is underdeveloped in others.

♦ ♦ ♦

A STUDY of recent building construction will serve admirably to illustrate how unevenly our country has advanced in its physical development. Our cities abound in towering office buildings, beautiful libraries and museums, wonderful hospitals and schools and many other magnificent structures.

In respect to some of these types of buildings the country has more than it needs. Undoubtedly there is more available office space than can be absorbed in several years. The supply of theaters, bank buildings, certain types of hotels and apartment houses and perhaps the larger single dwellings is more than adequate.

In contrast to this situation, consider the type of houses in which one-half or more of the population is living. A casual inspection of the low-rent residence section of any city will convince anyone that a real need for inexpensive but adequate houses exists in practically all of the larger cities and in most of the industrial sections.

Another factor of importance in the building situation is the migration of families from older areas near centers of population to suburban districts. This movement, coupled with many other influences, has created large sections of rundown property, usually within a few blocks of the principal business districts.

This situation is receiving more attention today than ever before. Civic leaders, social workers, architects and public officials are uniting in an effort to solve what is termed the "blighted area" or "slum elimination" problem.

Housing for low-income families is of direct interest to the steel industry because authorities who have gone into the matter deeply declare that the low cost of construction necessary to fit the pocketbooks of the prospective tenants or owners makes the use of steel almost imperative. Most of the estimates and many specifications for slum elimination projects call for more steel than is used in average construction today. In several instances practically the entire job is figured tentatively for steel.

Steel frames for houses no longer are a novelty and within the past year noteworthy progress has been made in designing and erecting houses with walls and floors of steel. Several novel steel dwellings will be demonstrated this year at the Century of Progress exposition in Chicago. Publication this month by the United States Steel Corp. of a comprehensive study of steel house design and construction is further evidence that the industry is beginning to sense the real possibilities for steel in this field.

The amount of steel consumed per unit of building construction has been increasing steadily since the World war. In 1930 and 1931 the average consumption of steel per square foot of floor space in buildings erected was 34.8 pounds, compared with an average of only 19.8 pounds for 1922 and 1923.

The market for steel in the neglected phases of the building field may easily eclipse the tonnage that went into large monumental buildings in the past. We believe the opportunities in small houses are greater than can be judged from surface indications at the present time.

♦ ♦ ♦

BECAUSE the automobile has proved such an important outlet for finished steel, it is natural that speculation should arise as to whether or not steelmakers can expect this consumer to continue to take 15 to 18 per cent of the ingot output annually.

Motor cars are built by mass production for mass consumption. With unemployment at normal, there is no question but what the output of cars would rise to 4,000,000 or more annually. As shown in an article in the Aug. 1, 1932, issue of STEEL, the number of automobiles taken out of service in 1931 and in 1932 exceeded the number manufactured in those years. At that date it was estimated that the motor car industry had before it 13 consecutive months at the peak rate of 1929 to neutralize the deficit that had accumulated since 1929.

Annual steel consumption per number of cars produced annually has increased since 1922 with only a few minor interruptions. This tendency may be checked by the present trend toward lighter cars. In total steel consumed, this factor probably would be more than offset by the increased output made possible by lower prices in the cheaper models.

The automobile is the accepted method of personal transportation. Millions recognize it as a necessity of daily life and when these millions are able to buy, production again will leap upward. In the long pull, the steel industry can expect much of the motor car industry, whose vitality even in depression is emphasized by its leadership in steel consumption in 1932.

♦ ♦ ♦

AS AN important consumer of steel, the petroleum industry presents an interesting illustration of how the character of demand may shift in a relatively short time. In the last decade much emphasis was placed upon the large tonnage of steel pipe used for underground transportation and distribution of gas, oil and gasoline. During that period the network of pipe lines increased from less than 50,000 to more than 93,000 miles.

New pipe mileage declined sharply after 1929 and during the depression only a few projects have gone beyond the surveying stage. Meanwhile, however, changes in the manufacture of gasoline have shifted emphasis in steel consumption to refinery equipment. The tonnage represented in this development is only a fraction of that involved in pipe line expansion, but the steel required for high pressure cracking is of special quality and commands high prices. Perfection of certain alloy steels and improvement in forging practice have helped the steel industry to win this market.

♦ ♦ ♦

NO BETTER statement of the needs of the railroads can be presented than that published in the Dec. 3 issue of *Railway Age*, a special number devoted exclusively to a comprehensive exposition of the present railway situation. Under the heading "Improvement Work Must Go On," that periodical states that the carriers will be compelled to spend at least half a billion dollars annually for additions and betterments as soon as confidence and credit are restored.

"Half a billion dollars is a lot of money," comments the *Railway Age*, "yet the investment of that amount in 1933 would represent a marked scaling down from the average annual expenditures which the railways ac-

tually made during the eight years ending with Dec. 31, 1930, in providing facilities commensurate with the demands for efficiency and economy in transportation. In those eight years, they spent $4,972,460,000 for improvements and betterments."

Electrification Projects Retarded

The imperative needs of the roads are varied. The *Age* points to many types of improved facilities required, most of which may be characterized as intensive rather than extensive developments. For instance, additional new-line mileage is required—not for expansion—but for relocation of present lines. As an example the 40-mile Dotsero cut-off, which will save 172 miles between Denver and Salt Lake City, is cited. In Chicago and other centers additional less-carload freight station capacity is needed. Express terminals are inadequate in a number of cities.

Steam railway electrification, particularly for suburban areas, has absorbed a large volume of capital during the last 2½ years. Removal of the uncertainty hanging over the heads of the roads would enable several lines to go ahead with electrification projects, long contemplated, that would reduce operating expenses considerably.

Changes in methods of shipping commodities constantly are imposing needs for new types of rolling stock. According to the *Railway Age*, "the demand for the movement of cement in bulk is growing rapidly and special types of cars are being provided which require manual labor neither for loading nor unloading. The use of similar cars will spread to other physically similar commodities."

"During the past two years air conditioning has been so adapted to both day coach and Pullman passenger car requirements that complete control of their interior atmospheres has become entirely practicable." The car coolers, described recently in STEEL, are only a stepping stone to self-contained air conditioning, which equipment may be expected to become standard on through passenger trains.

Must Relocate Facilities

Another point raised by the *Railway Age* article is the fact that longer runs between terminals require extensive reshifting of the location of facilities and also heavier motive power. Many round-houses, inspection points, classification yards and even repair shops are being and will be abandoned, merged or relocated and new ones created. As for locomotives, only 18 per cent now in service are less than 10 years old, yet only one unit was ordered in 1932. Improvement of motive power—practically suspended now—cannot be postponed indefinitely.

The need for grade revisions is pressing. "There is scarcely a railway in the United States," says the *Age*, "which does not now have in its files surveys and estimates covering from one to a dozen projects for grade and line revision that will be fruitful of large expenditures as soon as the railroad industry has been restored to solvency."

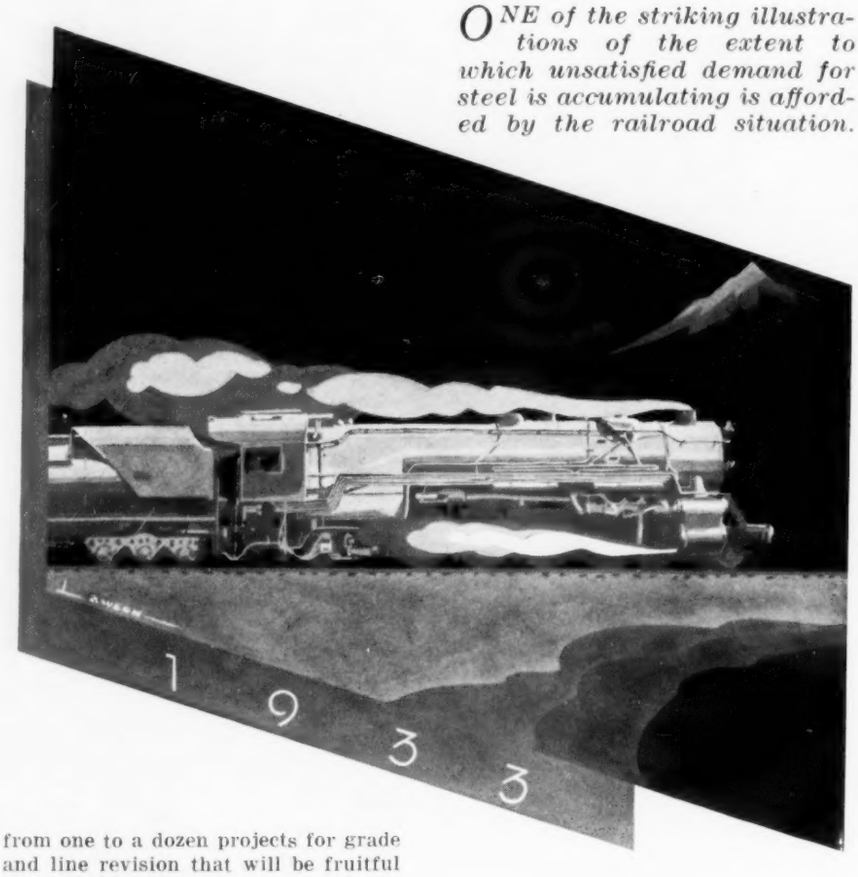
Railroads face the need of laying heavier rails on thousands of miles of main line. Increase of weight of rail calls for new track fastenings, new frogs, switches and crossings. "The railroads, generally, are merely awaiting the opportunity to invest in heavier tie plates, rail anchors and other improved appliances in order that they may enjoy the benefits already gained therefrom by some of the more forehanded managements."

The condition of the railroads, as indicated in the foregoing, is typical of many industries in that while the aggregate facilities are more than adequate for reasonable requirements, much of the plant and equipment is ineffective. This is due to obsolescence or to the fact that shifts in markets or sources of supply have left many establishments in localities poorly situated for efficient handling of business.

It is difficult to determine what this means in terms of future development. Many plants now idle, as in the case of hundreds of inactive cars and locomotives, never will be used again. Their owners may confidently expect to put these units back into service when conditions are more favorable, but experience under similar circumstances in the past shows that a large proportion of such plants, equipment, rolling stock, etc., does not return to service. Often the cost of rehabilitating it is more in relation to returns, than the cost of new units.

Plight of Railroads Shows How

ONE of the striking illustrations of the extent to which unsatisfied demand for steel is accumulating is afforded by the railroad situation.



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STEEL'S future in foreign trade is much more difficult to appraise than that of the domestic market. At the moment, the barriers erected as a result of debased currencies and arbitrary import duties are quite effective in restricting shipments of American steel products to foreign shores. In fact the situation is such that even if a demand for steel should develop in one or more foreign countries, import and exchange restrictions probably would make it impossible for the United States to compete with certain other nations.

A case in point arises from Japan's

developments in Manchuria. Should these activities require steel beyond Japan's limited production facilities, the price factor would favor Germany, France, Belgium or Great Britain, with the latter having the best chance because of its depreciated currency and its ability to furnish open-hearth steel.

Another development reacting against the United States is the extension by Great Britain of its high import duty on steel products. This will continue to shut out continental producers. Since Belgium and Luxemburg depend upon exports for disposing of 85 per cent of their output, France 50 and Germany 40 per cent, these countries will fight harder to win other world markets.

These situations, considered in conjunction with what has happened in Canada, indicate that the United States will be handicapped severely until some of the important world problems of political economy are ironed out. No one can predict whether this is a matter of months or years. In the meantime, it is important that American exporters exert themselves to hold a footing in foreign markets, so that they may be in a position to rebuild their trade when conditions are more propitious.

Steel Demand Is Accumulating

The roads ranked first, second or third in the consumption steel each year until 1932, when, because of a sharp curtailment in purchases, they dropped to fourth place (see page 62). Notwithstanding this fact, it is estimated by reliable authority that the railways in 1933 actually will need materials and services to the extent of half a billion dollars. In other words expenditures to this amount will be made if the carriers can get the money. The transportation systems' problem in 1900 still was one of expansion. Today it is one of refinement and adjustment to changing conditions. Intensive rather than extensive development will be the watchword when the roads resume activities.

• • •

STEEL faces a future of opportunity far greater than anything it has experienced in the past. In the years to come, fertile fields for business may not be found in the same places as in the first quarter of this century, but they will be there, awaiting development.

As intimated earlier in this article, consumption of steel in the broad future probably will come largely from those phases of national growth that have been stunted or neglected in the mad rush to national greatness. The chastening effect of the present depression will, we hope, force the American people to progress more uniformly. Less emphasis on the spectacular, a curb on growth dictated by desire for grandeur, and a positive embargo on the erection of palaces for the sole purpose of providing an outlet for investment funds would go a long way toward preventing excesses on one hand and neglect on the other.

A Utopia of Orderly Progress

Picture an America in which our ability, energy and unlimited resources are directed toward and distributed evenly over all of the projects essential to sane national progress! It would be a nation of adequate shelter for all. The well-to-do would have their luxurious homes, as now, but with numerous refinements now nonexistent. Workers in the low-income class would have comfortable dwellings, instead of hovels and delapidated ginger-bread structures held over from the mauve decade.

Our cities would be centers of uniform beauty and utility instead of a few towers surrounded by miserable box-like buildings typifying 20 different styles of architecture. Our boast that we have modern sanitation would be a reality and not a proud statement which now ignores the existence within three blocks of the center of almost every city of houses without running water and without adequate sanitary facilities.

In the rural sections, highways would be developed to serve the local residents, meaning that the emphasis would not be placed entirely upon the superhighways. Transportation would be co-ordinated more closely to the needs of the nation. Throughout the country, in urban and farm homes, many of the conveniences such as telephones, electric household equipment, etc., would be used more widely, instead of by less than a third of the families, as at present.

Opportunity for Steel!

This Utopian America will not come into being overnight. Its creation is the work of many decades. In certain minor ways, the task of transformation already is under way. Each step toward the ideal requires the services of steel, and in this tremendous job of remaking a hurriedly developed America, the steel industry will find opportunities surpassing anything that has gone before.

Consumption Ratios of Main Groups

	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922
Automotive	18.15	14.78	14.10	17.57	17.76	13.34	15.09	14.60	11.37	10.59	8.98
Buildings	16.38	16.80	17.80	14.70	15.22	14.89	13.10	15.26	14.44	13.53	11.84
Containers	10.79	7.90	5.77	4.67	4.56	5.21	5.24	4.20	4.96	3.68	4.16
Railroads	9.09	14.65	16.95	18.44	17.02	20.37	22.81	22.26	27.54	31.02	24.96
Oil, gas and water	5.50	9.75	9.48	9.01	7.72	8.90	9.29	8.03	8.43	10.60	14.84
Exports	3.31	4.10	4.34	4.83	5.52	5.39	5.29	4.47	5.89	6.22	7.82
All other	36.78	32.02	31.56	30.78	32.20	31.90	29.18	31.18	27.37	24.36	27.40

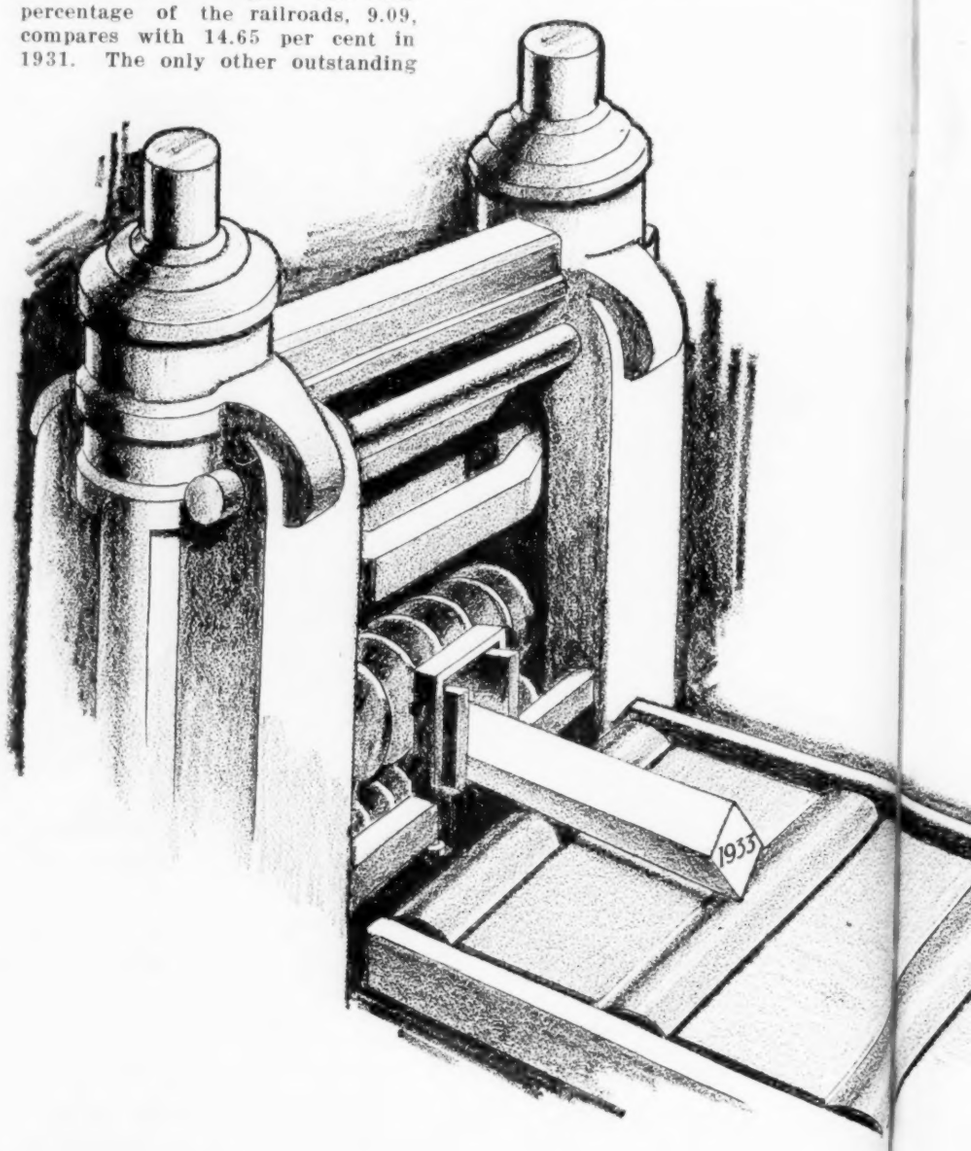
AUTOMOBILES TAKE MOST STEEL IN 1932

Container Group Takes Lead Over Railroads In Consumption of Finished Rolled Steel

MARKED changes occurred in the ranking of groups of steel consumers in 1932. The automobile industry, winner in 1928, again carried away the honors as the best customer of the steel industry in point of tonnage. It displaced the buildings group, leader in 1930 and 1931, by a narrow margin.

However, the most decisive upset was in the ousting of the railroads from their traditional position among the three highest consumers to fourth place. The new aspirant is the food and packing industry, embracing steel containers. The group in 1932 took 10.79 per cent of the total finished rolled steel output as compared with only 9.09 per cent for the railroads.

Comparison of the distribution of finished rolled iron and steel in 1932 with that of previous years shows several marked changes. The 1932 percentage of the railroads, 9.09, compares with 14.65 per cent in 1931. The only other outstanding decline was registered by the oil, gas and water group, which took only



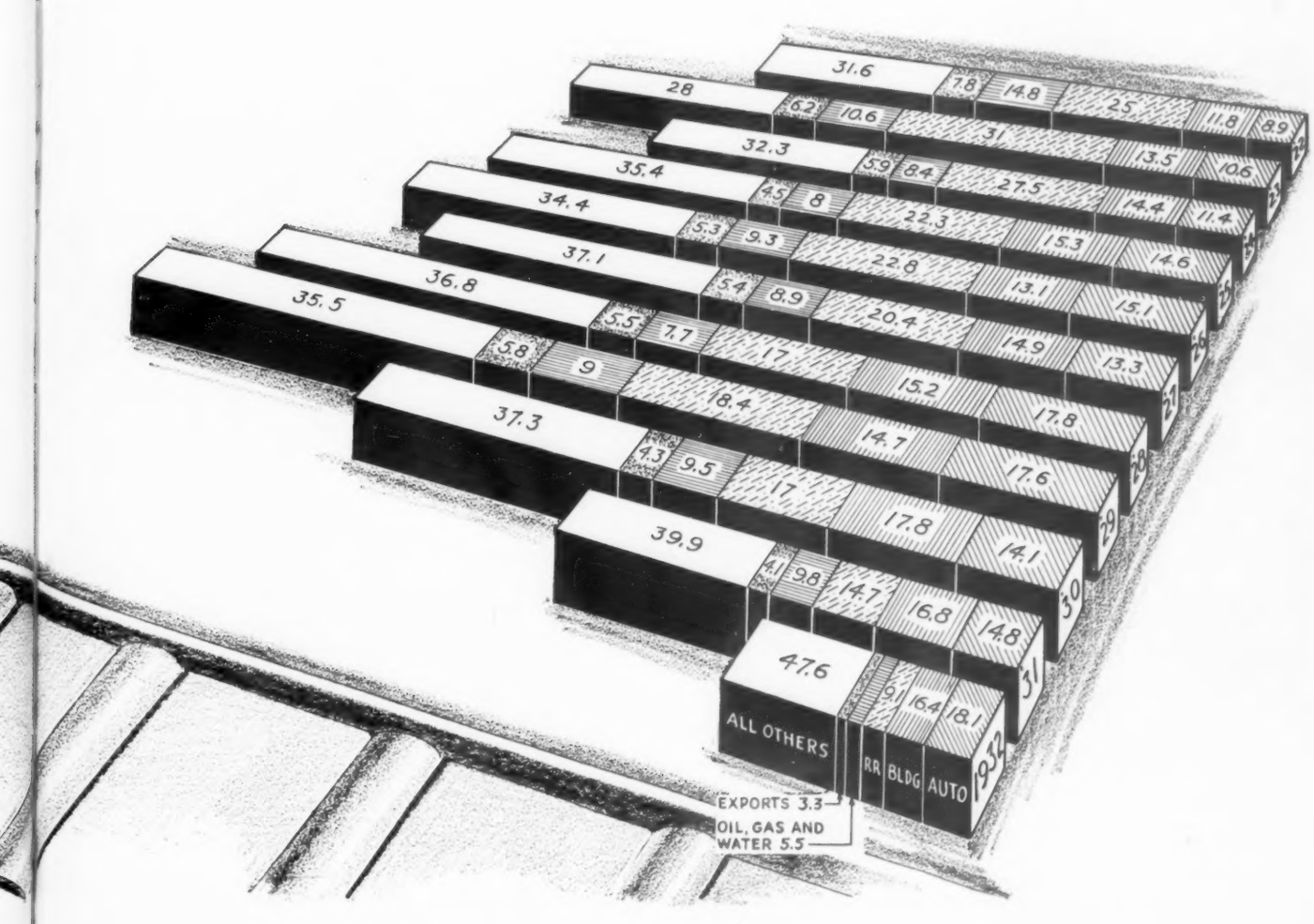
How Steel Ingots Shrink

		Gross Tons
Steel ingot production, 1932 (11 months actual, December estimated)		13,227,000
Ingot to forgings direct		50,000
		13,177,000
Loss in conversion, ingots to semifinished (20 per cent)		2,635,400
Semifinished steel production		10,541,600
Loss in conversion, semifinished to finished steel (10 per cent)		1,054,160
Total finished rolled steel		9,487,440
Distribution:		
	% of total	
Automotive	18.15	1,721,971
Buildings	16.38	1,554,043
Containers	10.79	1,023,695
Railroads	9.09	862,408
Oil, gas, water	5.50	521,809
Machinery	3.39	321,624
Exports	3.31	314,034
All other	33.39	3,167,856
Totals	100.00	9,487,440

Distribution of Steel in Per Cent to Consuming Groups

Based on 1932 Returns from 84 Operating Companies

	Rails, heavy and light	Angle bars, steel ties and other track accessories	Plates	Structural shapes over 3 inch	Bars, except concrete bars, and shapes under 3 inch	Concrete bars	Hoops, bands or narrow hot rolled flats	Black plate for tinning	All other black plate and sheets except galv. sheets	Galvanized sheets	Strip steel	Tubing and pipe	Wire products
1—Railroads													
a Cars and locomotives	....	0.43	9.37	2.30	4.67	....	1.46	....	1.63	1.90	0.55	1.08	0.99
b Track construction and repair	89.92	92.03	0.33	0.09	0.47	....	0.11	....	....	....	0.04	0.03	0.60
c Buildings and bridges	0.06	0.04	1.95	4.64	0.91	3.15	0.11	....	0.02	0.02	0.02	0.11	0.48
2—Buildings													
a Erection materials, framework, trim, etc.	0.06	....	23.23	65.59	8.00	43.64	2.25	0.14	2.84	9.48	1.58	3.22	6.08
b Furnishings, furniture, stoves, refrigerators, etc.	....	....	0.32	0.25	1.88	....	6.97	0.60	12.04	5.34	4.07	0.81	4.98
c Other miscellaneous products for buildings	....	....	0.31	0.07	0.32	2.63	0.87	0.80	2.00	6.50	3.00	3.72	0.54
3—Highways and highway bridges	....	....	0.77	2.12	0.57	35.44	0.24	....	3.46	1.28	0.04	0.02	3.77
4—Automotive	....	0.05	6.90	1.16	45.65	0.01	47.27	0.13	32.78	0.58	55.29	1.48	6.54
5—Oil, gas and water	....	....	16.63	1.01	0.58	0.79	0.58	0.57	2.49	0.70	0.11	37.02	0.72
6—Mining, quarrying, lumbering	4.70	3.68	1.78	0.49	0.32	0.24	1.44	....	0.23	0.37	0.02	0.15	0.86
7—Agricultural													
a Implements	....	0.02	0.71	0.26	3.17	....	10.33	....	0.80	1.04	1.15	0.20	1.60
b Other agricultural uses	....	....	0.77	0.24	0.84	0.21	2.86	....	0.22	1.80	0.17	0.03	10.51
8—Shipbuilding and repair	....	....	7.41	1.91	0.72	....	0.17	....	0.06	0.21	....	0.16	0.26
9—Machinery, tools, equipment (including electrical)	0.03	0.14	7.19	3.34	7.13	0.93	1.90	0.06	4.91	0.61	3.27	3.01	1.66
10—Food and packing industry (all containers)	....	....	0.17	0.04	0.18	....	7.79	81.20	5.64	1.43	1.96	0.06	1.53
11—Exports	4.30	1.40	3.35	3.65	1.53	1.05	1.38	6.47	1.68	7.70	1.28	4.87	3.47
12—Miscellaneous	0.59	0.55	11.14	2.27	12.83	2.09	10.28	5.18	17.71	5.85	22.83	2.79	19.00
Jobbers	0.34	1.66	7.67	10.57	10.23	9.82	3.99	4.85	11.49	55.19	4.62	41.24	36.41
Grand totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00



5.5 per cent of the total in 1932 as against 9.75 per cent in the preceding year. Minor losses were incurred by the agriculture, shipbuilding, export, mining and lumbering, and highway and bridge groups.

The sharpest gains were credited to the automotive industry, from 14.78 per cent in 1931 to 18.15 per cent in 1932; the food and packing industry (containers), from 7.90 to 10.79 per cent; and jobbers, whose percentage of consumption rose from 12.68 to 16.12 per cent. A minor increase was recorded for machinery and the building group, with 16.38 per cent in 1932 against 16.80 in the preceding year, practically held its ground.

It is apparent that much of the shifting in percentages of consumption is due to the unprecedented slump in purchases by the railroads and to the curtailment in tonnage taken by the oil, gas and water group. The sudden rise of the container group may be ascribed in part to the readjustment of all percentages arising from the decline in railroad and oil gas and water percentage, and in part to the fact that food containers are more essential in a period of depression than many other articles of steel. Tin plate output in 1932 compares more favorably with 1931 figures than that of any other finished steel product. According to the returns, output of tin plate was 1,058,623 tons, or 74.8 per cent of the total reported in the preceding year.

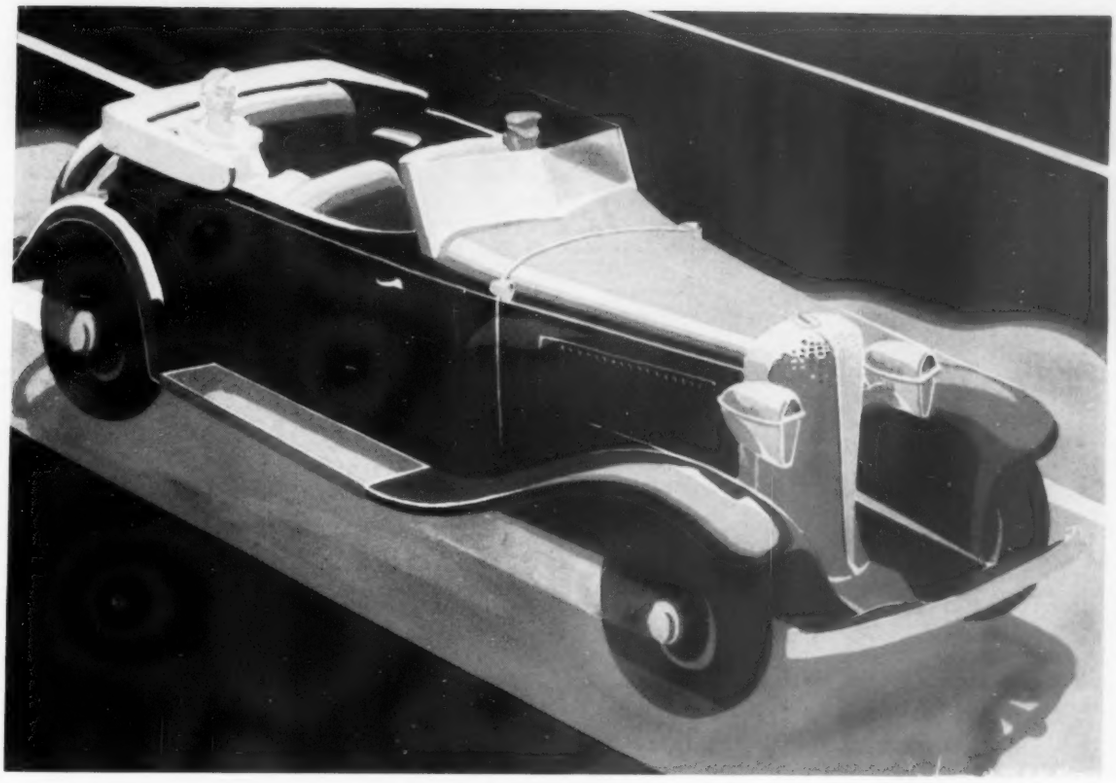
The reports from which the accompanying figures were compiled are unusually complete. Returns were received from 84 operating companies, which means that only figures from units with small tonnages are missing. The reported output of finished rolled iron and steel of the 84 concerns from which returns were received is estimated at 98.2 per cent of the output for the entire industry.

Distribution of Steel in Gross Tons to Consuming Groups

Based on 1932 Returns from 84 Operating Companies

	Rails, heavy and light	Angle bars, steel ties and other track accessories	Plates	Structural shapes over 3 inch	Bars, except concrete bars, and shapes under 3 inch	Concrete bars	Hoops, bands or narrow hot rolled flats	Black plate for tinning
1—Railroads								
a Cars and locomotives	.....	745	62,465	17,116	59,881	.....	4,242	8
b Track construction and repair	350,053	160,282	2,225	651	6,017	15	322	.....
c Buildings and bridges	228	69	13,024	34,411	11,707	7,638	305	.....
2—Buildings								
a Erection materials, framework, trim, etc.	213	7	154,810	486,429	102,578	105,826	6,520	1,471
b Furnishings, furniture, stoves, refrigerators, etc.	.....	.....	2,150	1,845	24,083	.....	20,223	6,382
c Other miscellaneous products for buildings	.....	5	2,077	500	4,147	6,386	2,513	8,453
3—Highways and highway bridges	.....	.....	5,159	15,728	7,296	85,926	698	.....
4—Automotive	27	79	45,987	8,619	585,004	27	137,066	1,344
5—Oil, gas and water	19	12	110,852	7,490	7,477	1,908	1,672	5,982
6—Mining, quarrying, lumbering	18,275	6,401	11,856	3,601	4,123	584	4,181	.....
7—Agricultural								
a Implements	.....	32	4,729	1,923	40,603	.....	29,955	.....
b Other agricultural uses	.....	.....	5,101	1,745	10,764	500	8,286	54
8—Shipbuilding and repair	.....	.....	49,396	14,166	9,263	.....	489	53
9—Machinery, tools, equipment (including electrical)	128	238	47,893	24,775	91,354	2,265	5,519	622
10—Food and packing industry (all containers)	.....	.....	1,093	331	2,242	.....	22,603	859,591
11—Exports	16,729	2,431	22,356	27,081	19,570	2,532	3,991	68,508
12—Miscellaneous	2,307	968	74,254	16,805	164,460	5,072	29,815	54,806
Totals	387,979	171,269	615,427	663,216	1,150,569	218,679	278,400	1,007,274
Jobbers	1,331	2,886	51,135	78,358	131,095	23,810	11,571	51,349
Grand totals	389,310	174,155	666,562	741,574	1,281,664	242,489	289,971	1,058,623

	All other black plate and sheets except galv. sheets	Galvanized sheets	Strip steel	Tubing and pipe	Wire products	All other finished steel products	Grand totals	Per cent of Total
1—Railroads								
a Cars and locomotives	24,838	8,587	3,196	9,273	9,095	41,456	240,902	2.59
b Track construction and repair	4	.....	238	218	5,533	6,843	532,401	5.71
c Buildings and bridges	295	77	91	985	4,412	565	73,807	0.79
2—Buildings								
a Erection materials, framework, trim, etc.	43,310	42,924	9,239	27,663	55,625	9,277	1,045,892	11.22
b Furnishings, furniture, stoves, refrigerators, etc.	183,773	24,200	23,724	6,961	45,580	704	339,625	3.64
c Other miscellaneous products for buildings	30,593	29,453	17,495	31,949	4,930	3,307	141,808	1.52
3—Highways and highway bridges	52,784	5,813	213	194	34,538	.....	208,349	2.24
4—Automotive	500,546	2,647	322,601	12,682	59,885	14,870	1,691,384	18.15
5—Oil, gas and water	37,948	3,166	638	317,937	6,590	11,245	512,936	5.50
6—Mining, quarrying, lumbering	3,528	1,686	132	1,300	7,856	1,289	64,812	0.70
7—Agricultural								
a Implements	12,200	4,723	6,733	1,744	14,674	4,131	121,447	1.30
b Other agricultural uses	3,417	8,156	1,000	300	96,175	750	136,248	1.46
8—Shipbuilding and repair	953	933	6	1,347	2,376	668	79,650	0.86
9—Machinery, tools, equipment (including electrical)	74,926	2,755	19,057	25,845	15,189	5,011	315,577	3.39
10—Food and packing industry (all containers)	86,143	6,497	11,439	505	14,033	614	1,005,091	10.79
11—Exports	25,730	34,889	7,483	41,782	31,796	3,796	308,674	3.31
12—Miscellaneous	270,356	26,479	133,192	23,977	173,912	21,232	997,635	10.71
Totals	1,351,344	202,985	556,477	504,662	582,199	125,758	7,816,238	83.88
Jobbers	175,456	250,008	26,967	354,247	333,331	10,192	1,501,736	16.12
Grand totals	1,526,800	452,993	583,444	858,909	915,530	135,950	9,317,974	100.00



Alloy Steel Will Help Industry To Win New Markets in Future

ONE of the most important factors in the future of the steel industry is the ability of steel, the material, to adapt itself to new requirements of civilization. Its versatility in this respect depends in large measure upon the development of alloy steels, because the alloying elements, with the aid of appropriate heat treating and processing, impart to the material many properties that enable it to penetrate markets that are closed to ordinary steels.

Production of alloy steel ingots and castings advanced steadily from a modest beginning in the first decade of this century to 1929, when the total fell just short of 4,000,000 tons. In this peak year the output of alloy steel amounted to 7 per cent of the total production of steel ingots and castings. While the depression has halted the upward trend of alloy steel, it is entrenched in a strong position and will surge ahead rapidly when present restraining influences are removed.

Indicative of the faith in the future of alloy steel held by executives in the steel industry is the research work of the Engineering Foundation. More than 60 corporations and scientific organization in the United States and the scientific academies of the three European nations are co-operating with the foundation in a world survey of alloy steel, for which a fund of $230,000 has been raised. Recently, when this body published a report of three years of progress on its 5-year program of research, this significant statement was issued:

"Our researches make it apparent that the steel industry has hardly scratched the surface in research and development, in spite of indications that the demand for cheap steel is gradually leveling off, showing that we are approaching a saturation point in that phase of the industry.

"The future of the steel industry lies in a turn to quality production rather than the quantity production of the past, and tremendous improvements and extensions in the manufacture and use of high quality alloy steels should be forthcoming in the next few years.

Where Alloy Steel Went, 1928-1932

Percentage of Consumption by Groups

	1928	1929	1930	1931	1932
Automotive	79.67	61.40	62.23	72.67	77.64
Machine tool	2.65	6.34	8.95	6.17	3.54
Oil industry	0.87	4.07	4.73	1.16	0.82
Agricultural	0.49	4.05	5.94	3.30	1.69
Construction	0.60	3.72	1.00	1.09	0.68
Export trade	1.18	1.38	1.16	0.88	0.43
Railroads	1.17	1.02	2.66	1.83	1.92
Shipbuilding	0.28	0.22	0.79	0.52	0.42
Miscellaneous	13.09	17.80	12.54	12.38	12.86

"The manner in which the big steel companies are co-operating with us in our program and the interest they are showing in our work indicate that the leaders of the industry are alive to the situation and are preparing to meet the problems of readjustment which are coming up."

That many steelmakers recognize in alloy products a powerful weapon with which to attack new markets in the future also is evidenced by the zeal with which alloy steel development has been maintained in spite of the depression. The total output of steel of alloy grade in 1932 of course was below that of recent years, but some of the specialties held up remarkably well.

How Alloy Steel Was Used, 1928-1932

Percentage of Consumption by Products

	1928	1929	1930	1931	1932
Hot rolled bars	81.70	61.87	70.50	54.48	77.28
Forgings	1.76	2.25	6.13	5.12	1.89
Hot rolled strip	0.95	4.43	3.86	1.31	0.66
Cold drawn bars	5.23	11.43	5.32	25.65	11.68
Plates	0.56	1.04	3.05	1.95	0.65
Pipes and tubes	5.93	6.33	8.84	8.60	4.80
Sheets	0.72	11.03	0.94	0.69	1.14
Tool steel	1.64	1.36	0.80	2.03	1.07
Structural shapes	0.18	0.12	0.42	0.07	0.11
Wire	1.19	0.05	0.08	0.06	0.28
Cold rolled strip	0.03	0.09	0.06	0.04	0.43
Merchant shapes	0.18	....	....	....	....

New Compositions Developed

Alloy steel producers made marked progress in improving the quality of their products and in developing new analyses. Advances were made in controlling grain size, cleanliness, surface conditions and tolerance in size. Improved forging with respect to grain size has improved strengths and changed machining conditions. More recognition is being given to the belief that the proper annealed structure in itself is not the only factor governing good machinability, but that flow lines in metals have an important influence in machinability and in the stress distribution.

The higher alloyed steels which generally are designated by the term "stainless," have been relatively more active during the past year than have the steels of lower alloy content, development of new applications being responsible for this more favorable showing.

In architecture and building construction, the use of stainless steel, principally of the 18-8 chrome-nickel composition, has expanded widely and today this material is utilized as ornamental work, trim and hardware on new buildings in many of our larger cities. This steel is employed to repair old historic buildings in Europe, and even in Russia its use now is contemplated in the new Soviet Palace building.

New equipment in the chemical, food, dairy, canning, paper, automotive, oil refining, and other industries exhibits a marked trend toward steels of the stainless types. Heat resisting characteristics are promoting the use of these higher alloyed steels in the manufacture of equipment in which long life at high temperatures has been an unusually difficult service requirement to meet.

The automotive industry continues as the largest consumer of alloy steel, over three-fourths of the combined finished tonnage reported in 1932 having been absorbed by this class of the trade. The next largest consumer of alloy steel made in 1932 was the machine tool industry, thus retaining its rating of former years. It absorbed 3.54 per cent of the alloy steel commodities tabulated on page 65. The third largest consumer was the railroad industry which accounted for 1.92 per cent of last year's output. Next from the standpoint of consumption was the agricultural industry which used 1.69 per cent of the 1932 output.

Bar Production Is Largest

Reports from various manufacturers in this country disclose that of the aggregate alloy steel production last year 77.28 per cent was converted into hot rolled bars. The automotive industry purchased 80.6 per cent of the bars manufactured and the machine tool industry 2.93 per cent. The automotive industry also accounted for 81 per cent of all the alloy cold drawn bars made in 1932. The next two largest buyers of this commodity were the machine tool industry which absorbed 3.89 per cent and the railroad industry which used 3.12 per cent of the national output.

Of the alloy steel plates shipped in 1932 by producers, 67.54 per cent went to the automotive industry, 5.80 per cent to construction, 5.47 to the machine tool group and 3.67 per cent to the shipbuilding industry. The machine tool industry purchased 29.54 per cent of all the alloy tool steel produced in this country in 1932. The automotive industry accounted for 14.33 per cent. The next largest consumer of this commodity, the oil industry, absorbed 6.21 per cent. Almost half the output of forgings of alloy quality in 1932 was taken by the railroads. The automotive industry consumed 34.55 per cent and machine tool builders 8.49 per cent. The shipbuilding industry purchased 4.59 per cent of the alloy forgings manufactured and the oil industry 2.29 per cent.

Distribution by Percentage of Alloy Steel in 1932

Shown by Consuming Groups and Individual Products

Group	Hot rolled bars	Cold drawn bars	Sheets	Plates	Pipe and tubes	Wire	Structural shapes	Hot rolled strip	Cold rolled strip	Tool steel	Forgings
1. Automotive	80.60	81.00	1.94	67.54	82.38	17.70	....	44.21	73.18	14.33	34.55
2. Machine tool	2.93	3.89	13.29	5.47	0.05	....	4.87	19.16	5.09	29.54	8.49
3. Railroad	0.87	3.12	0.38	1.80	....	....	....	....	....	1.61	45.31
4. Agriculture	1.30	2.23	0.34	....	7.32	4.66	....	4.84	0.20	0.32	1.10
5. Construction	0.49	0.49	0.08	5.80	1.28	....	90.26	0.46	9.37	....	....
6. Shipbuilding	0.16	1.26	1.03	3.67	....	....	1.87	....	....	1.98	4.59
7. Oil industry	0.57	1.02	0.11	0.33	2.93	....	....	....	....	6.21	2.29
8. Exports	0.42	0.50	0.57	0.93	0.54	....	....	....	....	0.69	0.23
9. All other	12.66	6.49	82.26	14.46	5.50	77.64	3.00	31.33	12.16	45.32	3.44

NEED FOR REHABILITATING EQUIPMENT WILL BE GREATER IN 1933

By J. D. KNOX
Associate Editor, STEEL

POLICY-MAKING executives of the steel industry in 1932 were confronted with difficult problems in regard to plant and equipment. Caution dictated by the uncertainties of the immediate outlook and economy in expenditures of capital forced by continued large deficits caused management to withhold many decisions that otherwise would have been made without delay.

Many of these questions bear directly on the future trend of development in blast furnace, steelworks and rolling mill equipment. For illustration, consider the broader phases of the choice between high-production continuous mills and low-production conventional-type units.

Greater Flexibility Is Needed

Each type has well-known advantages. In a year like 1929, the continuous mill makes a creditable showing in spite of its higher unitial cost and its single-purpose characteristics. In 1932, however, production was at such a low level that only on rare occasions was it possible to group sufficient tonnage to permit of operation of this type of mill under favorable circumstances.

In many merchant mills as many as 30 roll changes in a 24-hour run constitute common practice. Under such a schedule the fewer the automatic features in the equipment, the greater is the flexibility.

For this reason many operators are considering whether or not it would be wise to rely on smaller, less costly equipment which is more easily adapted to small lot business.

Another complicating factor is the ever present bugaboo of obsolescence. Even during the current lull in new construction new ideas are being crystallized into equipment which already threatens to out-mode existing installations that have not yet had a chance to earn an adequate return on their initial cost. Perhaps this is a partial explanation for the attitude displayed by several rolling mill executives in demanding equipment that will pay for itself in 18 months or less.

In spite of these and other problems that make decisions extremely difficult in the present period, producers rapidly are approaching a time when at least minimum essential work must be released. The officials of one company, who on several occasions have postponed action on a rehabilitation program involving several million dollars, now appear to be on the point of closing. When the national committee on industrial rehabilitation recently announced pledges for contemplated plant improvement, the names of several steel companies were mentioned prominently. The United States Steel Corp. previously had announced an appropriation of $5,000,000 for "replacement and improvement of equipment," and several other companies have set aside smaller amounts for similar purposes.

Whereas rehabilitation in 1932 was to many companies a matter of choice, in 1933 action may be forced in certain cases by the inadequacy of present run-down equipment. One steelmaker is contemplating several important purchases because he is convinced he is losing ground in a highly competitive market owing to a deterioration in quality of product which is ascribed to obsolete facilities.

Steel producers have a problem in connection with supplies necessary for the operation of furnaces and mills. A rise to 30 to 35 per cent in steel ingot operations would necessitate the release of orders for refractories, ingot molds, rolls and marked increases in lubricants and other supplies. Inventories of these essentials are at a bare minimum. In fact attempts to economize, particularly in connection with ingot molds and rolls, have resulted in interruptions costing far more than the money saved by the non-buying policy.

No New Open Hearths in 1932

The conditions enumerated in the foregoing point to the fact that the steel industry has gone about as far as it can without replenishing its supplies and replacing some of its equipment. It has been remarkably successful thus far in "living on its fat."

Turning to the record of new construction in 1932, as compiled anually by STEEL, the most striking fact is an absence of open hearths completed or building. A total of 21 new rolling mills were completed, as against 33 in 1931, and 14 were under construction on Dec. 31, 1932 as compared with 21 a year ago.

The fact that rolling mill capacity is being added whereas expansion in ingot facilities has been stopped lends support to the often reiterated belief that finishing capacity has lagged behind steelmaking potentialities. Also it probably is true that obsolescence generally is more pronounced in rolling mills than in steelmaking furnaces.

Four-high mills for the production either of plain strip, sheets, light-gage plates or strip for tinning; and, further mechanization of conventional-type hot sheet mills were the two major factors which gave support to last year's program of improvements

Table I

Recapitulation

	Completed 1932	Building 1932
By-product coke ovens	138	0
Stacks remodeled	3	1
Rolling mills:		
Bar	0	3
Blooming	0	1
Pipe, buttweld	1	1
Plate-strip	2	0
Roughing	0	1
Sheet, 3-high hot	0	2
Sheet, 4-high cold	0	2
Strip, 2-high cold	1	0
Strip, 2-high hot	1	0
Strip, 4-high cold	6	1
Strip, 4-high cold	*5	*2
Strip, 4-high hot	2	1
Tube, electric weld	1	0
Tube, push bench	1	0
Tube, seamless	1	0
Total	21	14

*Rolls frictionally driven.

in the iron and steel industry. A review of the industry, in the opinion of one authority, indicates that during prosperous periods when large sums of money are available, steel plant executives lean toward the installation of large continuous units designed for attractive capacity, whereas they now are more concerned with increasing the productivity of labor to enjoy lower costs, even though mill operations are on a reduced scale.

The future position of sheet and tin mills of the conventional type will depend largely upon the keenness and ability of executives to plan the modernization of their plant and to install furnace equipment that will permit the use of oil, producer gas or clean gas, utilizing the one that will give the lowest fuel cost at any particular time. In the second place, the equipment should be designed to use either sheet bar of normal 8-inch width or wide sheet bar of strip breakdown, depending upon which is offered at the most attractive price as a raw material. Finally, the design should include flexibility to afford production of all grades of sheets.

Mills Start Initial Operation

Four mills placed in initial operation in 1932 aroused the interest of engineers and steel producers alike—the continuous strip mills of the Otis Steel Co., Cleveland and the Inland Steel Co., Indiana Harbor, Ind.; the wide flange beam mill of the Illinois Steel Co., South Chicago, Ill.; and, the experimental 4-high mill with electrically driven rolls for hot rolling strip and other flat material at the Brier Hill plate division of the Youngstown Sheet & Tube Co., Youngstown, O.

The 4-high tandem cold strip mill of the Otis Steel Co. produces strip 72 inches wide, the greatest width ever rolled cold in any metal in the form of strip by the continuous method. The mill is equipped with numerous auxiliary machines never before used, which according to the maker will tend to revolutionize cold rolling methods for wide metals.

Stock Handled Automatically

An uncoiler receives the strip as it comes from the hot strip mill, detaches one end of the coil and delivers it into the gap of the cold rolls. A new type guide on the mill works in conjunction with this operation. The strip passes through the different mills in tandem and then is taken by another newly-devised unit, a reel guide machine, which automatically delivers it onto the cold strip reel. When fully wound, the drum of the reel collapses, permitting the strip to be removed. The final product then is delivered with no manual operation other than the use of control buttons.

The new continuous plate and strip sheet mill of the Inland Steel Co., is designed for rolling plate from 3/16 to ½-inch thick and up to a maximum width of 69 inches. For continuous strip the width varies from 24 to 66 inches, depending upon commercial requirements and gage. The mill has a rated capacity of 100 tons an hour, working on 16 gage stock, 48 inches wide. Serving the mill proper are many interesting accessories including two 1000-gallon, 1000-pound pressure hydraulic pumps for removing scale, automatic oiling and greasing systems and air filtering systems for the various motor drives. Further details are presented in the March 28, 1932 issue of STEEL.

Produces Heavy Structural

The new wide flange beam mill of the Illinois Steel Co., is designed to produce structural shapes ranging from 8 to 36 inches deep with flanges from 6 to 15 inches wide and weighing from 21 to 425 pounds per foot. The capacity of the mill is estimated at 40,000 tons a month. The unit includes a 54-inch reversing blooming mill, a 52-inch reversing roughing mill, a 52-inch intermediate reversing stand and a 52-inch one-pass finishing stand, and was described in the March 21, 1932 issue of STEEL.

Only one stand of 4-high rolls is used for hot rolling strip on the Steckel-type mill, this being served by two elevated holding furnaces, one spanning the approach table and the other the delivery table. Mounted inside each furnace is a 48-inch diameter reel made of heat-resisting steel. Slabs, 9 feet long, are fed by a pair of pinch rolls into the 4-high mill equipped with 20-inch diameter work rolls and 36-inch backup rolls, all with a 72-inch body. The steel is given 11 passes back and forth through the mill and, following each reduction, is conveyed beneath the holding furnace spanning the roller table, away from the mill.

Restores Spent Heat

Previous to the eleventh pass a set of dogs is canted on the roller table on the run-out side and, as the front end of the piece emerges from the mill and finally the pinch roll, it is directed at an upward angle by the dogs into the holding furnace and reeled into a coil while reduction of the remaining section continues. The holding furnace is gas fired and preserves the steel at 1600 degrees Fahr. When the rear end of the work emerges from the mill and still in the grip of the pinch rolls at the exit side, the mill is reversed and the strip returns through the work rolls and pinch rolls and into the opposite holding furnace where it again is reeled and restored to a temperature of about 1600 degrees.

Equipment Completed and Building in 1932

Table II

Stacks Remodeled in 1932

Company	Number or name
Ford Motor Co., Dearborn, Mich.	Henry
Great Lakes Steel Corp., Detroit	"B"
Republic Steel Corp., Youngstown, O.	No. 2
Total	3

Table III

Stacks Being Remodeled Dec. 31, 1932

Company	Number or name
Bethlehem Steel Co., Sparrows Point, Md.	*"D"

*Replacement; 1000 tons or more daily capacity

Table IV

By-Product Ovens Completed in 1932

Company	No. of ovens	Type of ovens	Est. annual coking capacity, tons
Illinois Steel Co., Gary, Ind.	138	*K-B	1,021,200

*Koppers-Becker

. . . . . What of Its Future?

Following the final pass, the steel instead of entering the holding furnace is conveyed away from the mill by a roller table to a cold motor-driven reel and wound into a coil. As delivered to this coiler, the piece measures 400 feet long and 20 inches wide and gages 0.109-inch or about 12 gage.

Builds Experimental Mill

A new twin motor cold strip mill, an experimental unit, was installed at a plant in Youngstown, O. to demonstrate revolutionary changes in rolling mill practice. In this machine the conventional pinion stands and gear drives of earlier usage, have been discarded completely and the mill is driven by two motors, one for each of the two working rolls, properly synchronized. The mill is of the 4-high type, and is so flexible in its application as to duplicate almost any desired strip rolling condition. It can be operated with almost any size or type of working rolls and changed quickly from one to another. It works at various and desired speeds and also has the automatic reel equipment.

While the automatic tilting tables particularly are suited to handle comparatively long packs on 2-high hot sheet mills, a departure from this usual arrangement has occurred. A Youngstown district plant as well as a plant in Gary, Ind. and one in Vandergrift, Pa., now is installing a 3-high roughing or breakdown mill, to handle bars 12 inches and wider, which is equipped with special automatic front and back tables. In addition to the usual motor-driven conveyor chains and motor-operated tilting mechanism, the feeder table is equipped with a motor-driven auxiliary chain on which are mounted dogs to assume that the bars are aligned properly and equally spaced before entering the rolls.

Two bars are handled in succession for the first two or four passes, after which they are matched by a motor-driven matching device and given one or three additional passes together. The mill also is equipped with a motor-driven screwdown, with an automatic limit switch control so that all screwdown settings are made automatically. The various movements of the front and back tables, matching device, and screwdowns are controlled in the proper sequence by a trigger switch and master control drum, and the operation of the entire roughing mill thus is made most entirely automatic with resulting increased mill output and reduced production costs.

Enlarges Finishing Facilities

Improvements at Southern plants are of a miscellaneous character. At the Fairfield works of the Tennessee Coal, Iron & Railroad Co. finishing facilities at the bar and structural mill were rearranged and an additional boiler and cooling tower installed at the electric power station. At the opening of the new year sheet mill producing facilities at this division of the corporation were being extended. One of the Thomas stacks of the Republic Steel Corp., at Thomas, Ala. was equipped with a roller bearing revolving distributor of the McKee type. The top structure of No. 1 stack of the Woodward Iron Co., Woodward, Ala. also was altered to include a revolving distributor of the type just mentioned and the four hot blast stoves equipped with high-pressure gas burners, new type gas shutoff valves and an electrically-operated combustion controller, all of the Freyn type.

Ladles Assembled by Welding

Many steelmakers in the country now are using ladles of welded rolled steel construction in their open-hearth department, a new development of the year just closed. The ladles, which were placed in service last May, were designed for a capacity of 85 tons but heats of larger tonnage are handled on many occasions.

Three 500-horsepower fire-tube waste-heat boilers and a 12-inch steam line 1800 feet long connecting these units with other departments, are being installed at the open-hearth division of the Central Iron & Steel Co., Harrisburg, Pa. The open-hearth department in addition has been equipped with a 32,000-gallon settling tank and boiler-feed pump for supplying treated feed water to the new waste-heat boilers; water-cooled valves on several furnaces; a complete combustion control on one furnace and, automatic temperature reversing controls on another furnace. While no major improvements have been scheduled definitely for 1933 by the Central officials, yet plans and estimates are being prepared and studied in connection with a proposed electric power plant to meet present and future requirements. In event this improvement is authorized several additional open-hearth waste-heat boilers will be installed.

In addition to the installation of an electric welder for assembling

Rolling Mills Completed and Building in 1932

Table V

Rolling Mills Completed in 1932

Company	No. stands		Type mills
Allegheny Steel Co., Brackenridge, Pa.	4	30″	4-high hot strip
American Rolling Mill Co., Butler, Pa.	*1	20″	4-high cold strip
American Sheet & Tin Plate Co., Gary, Ind.	1	42″	4-high cold strip
Babcock & Wilcox Co., Beaver Falls, Pa.	1		seamless tube
Cold Metal Process Co., Youngstown, O.	*1	7½″	4-high cold strip
Fretz-Moon Tube Co., Butler, Pa.	1		buttweld pipe
Heppenstall Co., Pittsburgh	1	10″	hot strip
Heppenstall Co., Pittsburgh	2	8″	cold strip
Inland Steel Co., Indiana Harbor, Ind.	6	76″	4-high plate-strip
Inland Steel Co., Indiana Harbor, Ind.	7	54″	4-high cold strip
Inland Steel Co., Indiana Harbor, Ind.	3	42″	4-high cold strip
Jones & Laughlin Steel Corp., Aliquippa, Pa.	1		push-bench tube
Otis Steel Co., Cleveland	4	72″	4-high plate-strip
Otis Steel Co., Cleveland	2	72″	4-high cold strip
Republic Steel Corp., Massillon, O.	1		4-high cold strip
Sharon Steel Hoop Co., Sharon, Pa.	4	20″	4-high hot strip
Signode Steel Strapping Co., Chicago	*1	7½″	4-high cold strip
Spang Chalfant & Co. Inc., Ambridge, Pa.	1		elec. weld tube
Thomas Steel Co., Warren, O.	1	12″	4-high cold strip
Weirton Steel Co., Weirton, W. Va.	*1	20″	4-high cold strip
Weirton Steel Co., Weirton, W. Va.	*1	26″	4-high cold strip
Total	45		

*Rolls frictionally driven.

Table VI

Rolling Mills Building Dec. 31, 1932

Company	No. mills		Type mills
American Sheet & Tin Plate Co., Gary, Ind.	1	84″	4-high cold strip
American Sheet & Tin Plate Co., Gary, Ind.	1		3-high hot sheet
American Sheet & Tin Plate Co., Gary, Ind.	1		4-high cold sheet
American Sheet & Tin Plate Co., Vandergrift, Pa.	1		3-high hot sheet
American Sheet & Tin Plate Co., Vandergrift, Pa.	1		4-high cold sheet
Andrews Steel Co., Newport, Ky.	1	34″	blooming
Andrews Steel Co., Newport, Ky.	1	26″	bar
Andrews Steel Co., Newport, Ky.	1	24″	bar
Andrews Steel Co., Newport, Ky.	1	30″	4-high hot strip
Bethlehem Steel Co., Sparrows Point, Md.	1	8″	bar
Follansbee Brothers Co., Follansbee, W. Va.	*1	38″	4-high cold strip
Laclede Steel Co., Alton, Ill.	1	14″	roughing
Mercer Tube & Mfg. Co., Sharon, Pa.	1		buttweld pipe
National Tube Co., Ellwood City, Pa.	**1		seamless tube
Republic Steel Corp., Warren, O.	*1	38″	4-high cold strip
Total	14		

*Rolls frictionally driven.
**Rebuilding.

mesh and bar mats, the Laclede Steel Co., Alton, Ill., equipped its 8 and 10-inch strip mills with new producer-gas mains and valves, installed a superheater in the boiler house and a rod coiler on the 8-inch mill.

All steels previously made in crucible furnaces at the plant of the Firth-Sterling Steel Co., McKeesport, Pa., now are melted in electric induction furnaces with a distinct improvement in uniformity and quality. During the year just closed this company added a new plant for making sintered carbide wire drawing dies.

Nineteen thirty-two witnessed a continuation of the policy of abandoning older iron and steelmaking units. While the amount of equipment definitely consigned to the scrap heap in 1932 probably was not much greater than in the previous year, the pressure of taxes, maintenance charges, etc., on idle obsolete plant and property forced owners to give more thought to abandonment.

In addition to the blast furnaces abandoned, as listed in one of the accompanying tables, two steel plants and a puddling plant either passed out of existence last year or are scheduled for demolition or transfer this year. The Braddock works of the American Steel & Wire Co., Braddock, Pa., was acquired by the Carnegie Steel Co. last year and razed to make way for new construction.

One of the oldest rolling mills in the country, that of the Pittsburgh Forge & Iron Co., North Side, Pittsburgh, built in 1867, succumbed to the march of progress. It is to be dismantled for its 7000 tons of iron and steel scrap.

Then in December of last year came the announcement that the Newburg steel works of the American Steel & Wire Co., Cleveland, including seven open-hearth furnaces, two bessemer vessels, and a blooming and rod mill, will be abandoned.

Moving of plants from one city to another was noted in several instances. Companies operating in several communities have done considerable shifting of operations in order to concentrate production in low-cost establishments or in favored locations.

A few purchases of used mill equipment for additions to the facilities of existing plants were reported. In this connection the 10-inch 3-high 6-stand merchant bar mill formerly owned and operated by the Cleveland Hardware Co., Cleveland, was sold to the Sheffield Steel Corp. early last year and removed to the latter company's plant at Kansas City, Mo.

Table VII

Blast Furnaces Dismantled in 1932

Company	Name of stack
American Rolling Mill Co., Ashland, Ky.	No. 2
Bethlehem Steel Co., Coatesville, Pa.	"A" and "C"
Bethlehem Steel Co., Johnstown, Pa.	"D"
Jones & Laughlin Steel Corp., Pittsburgh	Soho
Valley Furnace Co., Dover, O.	Dover
Warren Foundry & Pipe Corp., Wharton, N. J.	"A" and "B"
Youngstown Sheet & Tube Co., Mayville, Wis.	"A" and "B"
Total	10

Electricity in Homes Opens Markets for Steel

CONSIDERING the conveniences brought to American homes through the magic of electricity, who would care to return to the drudgery of housekeeping as it existed in 1900? Electricity has opened the way to constantly expanding markets for steel and steel products. One of its latest contributions is the electric refrigerator. Production of this device registered an increase in 1931 despite the depression which affected adversely many products. Markets for many electrical devices, involving the use of steel, still are far from the saturation point.

Recovery of Business To Take Measure of Roosevelt Regime

By LYNNE M. LAMM
Washington Correspondent, STEEL

Blank & Stoller Inc.

President-Elect Franklin Delano Roosevelt

DISSEMBLE as business will and maintain that its course will be immune to any but the most adverse developments at Washington, the fact remains that a change in the national administration such as will occur March 4 when Franklin Delano Roosevelt succeeds Herbert Hoover as President must cut horizontally through the entire economy of the nation.

Superficially, the iron and steel industry will be most vitally interested in such matters as the tariff and taxes, which have a very direct incidence upon it, but because the industry in most instances lacks contact with the ultimate consumer it will be sensitive to almost every development, national and international.

The handling of war debts and international relationships, the radical or conservative character of appointments to federal office, the approach to reduction of the federal deficit, the policy in regard to the funded debt, the deportment toward Japan and Manchukuo—all these apparently unrelated problems will be found affecting the commercial life of the nation and its foreign trade and determining the volume of the railroad, automobile, building and other businesses, which are so largely consumers of iron and steel.

A change in the complexion of the government at Washington does not happen often. In the lifetime of the business man who embarked upon his career in 1898 or later—a span of 35 years—it has happened only twice. That was when Woodrow Wilson took office in 1913 and Warren G. Harding in 1921. There were abnormalities both times, as in 1913 the world was heading into the war and in 1921 was emerging from it.

The turnover will be much more complete than the transition of one President to another within a party. In every responsible office in Washington, as soon after March 4 as it can be accomplished, a new executive will be seated whose ideas presumably will vary materially from those of his predecessor. In the course of the next four years the new President, for example, will appoint a majority of the federal trade commission and sufficient new members of the interstate commerce, trade and tariff commissions to color the policies of those bodies.

Still Await a Roosevelt Plan

Only a seer could foresee the events of the next four years, but certain impressions already are being formed. One is that the Roosevelt administration is within two months of taking office without giving any outward indication of a program or "a plan," such as was stressed so forcibly during the campaign. Another is that the cabinet will have fewer personalities of really big caliber than might have been hoped from the quality of the support of Governor Roosevelt during the campaign.

On the other hand, Governor Roosevelt is concluding his third term in New York state without having made a major blunder. He comes with the reputation of being able to work with a legislative body, whether or not favorable to him—a quality patently lacking in President Hoover. He will find on Capitol Hill a house of representatives and a senate of his own political complexion, for two years at least.

There is one basic fact which business can make its own: The Roosevelt administration will court success, which in politics is measured by a second term, and the yardstick for its success will be the prosperity of the country. There may be honest differences of opinion on the approach to that prosperity, but its achievement will be the guiding motive of the administration. The temptation to pursue a fetish will be tempered by the desire to restore business. A sense of responsibility will be sobering.

In appraising the situation it must be clearly borne in mind that the present session of congress—the second session of the seventy-second—automatically adjourns March 4. Democrats are in control of the house, but they have avoided a contest for leadership in the senate, which apparently they could win. Congress has been in session since Dec. 5 without accomplishing anything of benefit to industry, and there is little expectation of it.

As is usually the case with the so-called short sessions—which, incidentally, will be last if the constitutional amendment ending them and

seating the President on Jan. 20 instead of March 4 retains the popularity it has displayed—the congressional machine functions rapidly at first, then slows down, achieving little.

The strategy of Republican leaders in both houses is to avoid any action except on appropriations for the fiscal year beginning next July 1, and even these are not essential, for they can be passed at a special session.

Special Session Is Inevitable

Democrats would prefer passing appropriation measures, liberalizing farm relief and making a gesture toward balancing the budget, in order to permit the new President to have until next December without a congress on his hands. But Republicans choose to dump these vexatious problems in the lap of the new administration, and unquestionably this is what will happen.

Much as it will be against his will and inclination, it appears therefore that Governor Roosevelt will be compelled to call a special session of congress shortly after his inaugural. He knows what the special session called by President Hoover in 1929 did to him, and wants to avoid calling one if he can, but will not be able to. This is the opinion of those closest in touch with the situation and able to prophesy.

In this special session nothing will be more important than taxation. Figures of the treasury department for the first six months of the current fiscal year, that is, from last July 1 to Dec. 31, show that the government has run approximately $1,000,000,000 behind. In other words, the budget is not being balanced by about $2,000,000,000 a year. This makes some new tax legislation inevitable.

Early in 1932 the house ways and means committee recommended a producers' sales tax of 2¼ per cent, but on the floor of the house insurgent Democrats and Republicans organized a bloc, upset the leadership of Speaker Garner and defeated the tax. In his message to congress in December, President Hoover again recommended the tax.

Roosevelt Kills Sales Tax

Late in December the prospect for a general sales tax looked bright. Estimates of the possible revenue to be derived from legalized beer were pared to $200,000,000, and some former opponents of a sales tax appeared converted to this method of helping balance the budget. But unofficially the word was conveyed from Albany that Governor Roosevelt was "horrified" by the suggestion of a general sales tax, though not averse to an impost on some luxuries, and immediately this form of tax was considered out.

With his disapproval of a general sales tax, Governor Roosevelt tacitly assumed the responsibility for balancing the budget after March 4, insuring that except for the possibility of continuing the 1 per cent federal gasoline tax and perhaps reducing local postage from 3 cents to 2, the activity of the short session of congress in connection with tax matters would be largely fact-finding. A clarification of Governor Roosevelt's tax and budget views early in January was a possibility.

The party pledge to reduce federal expenditures 25 per cent promises complications. To fulfill the pledge without curtailing expenditures on war veterans appears impossible, since these expenditures account for almost two thirds of the amount of money appropriated by congress for government expense.

Governor Roosevelt is said to be apprehensive—and rightly so—that if he calls a special session the cry for tariff revision will be so great among his own partisans that he will not be able to avoid taking some action.

Grows Conservative on Tariff

As the presidential campaign of 1932 wore on, it will be recalled that Governor Roosevelt became more conservative in his attitude on the tariff. At first, the Hawley-Smooth tariff act included every possible iniquity; later, he intimated that he would not deprive agriculture of whatever protection the act afforded it nor would he eliminate protection to those industries not using the tariff as a cloak to exact unfair prices from their domestic trade.

It is strongly suggested that Governor Roosevelt will ask the tariff commission to make a study of reciprocal tariffs in the hope and perhaps knowledge that it will take a year or two to complete such a study, and thereby he might win a breathing spell before going actively into a tariff fight.

It is also pointed out that one way out for the new President in the tariff tangle would be for him to state publicly that he was negotiating for reciprocal tariffs with foreign countries, and this would take the matter out of the hands of congress for the time being at least.

But will the rank and file of the Democratic party demand a sweeping revision of the tariff, as happened under President Wilson in 1913? The division within the party is not sectional, as some southern Democrats voted for the Hawley-Smoot measure for the protection afforded their constituencies.

Experience shows that if the tariff schedules are opened up for minor revision, congress will not be content until the entire act has been revised. This is something President Hoover knows from experience. He proposed additional protection for agriculture, largely on the recommendation of Senator Borah, but the industrial as well as farm schedules were revamped, and Senator Borah promptly left President Hoover high and dry.

Flexible Provisions in Disfavor

Democrats are not in favor of the present flexible tariff, whereby the tariff commission may investigate and recommend adjustments to the President up or down to a limit of 50 per cent. This was shown by the fact that no longer ago than the last session of congress they forced through a bill which would have taken these flexible powers away from the President. The bill was vetoed by President Hoover.

The principal provision of this bill, it will be recalled, was that the tariff commission in making its reports should submit them to congress and not to the President. It is hinted in some quarters that a similar bill will come up when congress first meets after March 4.

It is not considered likely that Governor Roosevelt will try to reorganize the tariff commission until he has had a chance to look the situation over carefully.

During his administration Governor Roosevelt will have an opportunity to change very materially the complexion of the interstate commerce commission. There are 11 members on the commission, each with a 7-year term, which means that at least one term expires each year, and in some years two.

At this time there are six Republicans, four Democrats and one independent on the commission. One term expired Dec. 31—that of E. I. Lewis, Republican, of Indiana. President Hoover has renominated Commissioner Lewis but there is no chance of confirmation. The next term to expire is that of Ezra Brainerd Jr., Republican, of Oklahoma, next Dec. 31.

Transportation Policy Needed

In the campaign, Governor Roosevelt declared for a transportation policy that would safeguard and co-ordinate the various forms. The railroads at present desire the extension of the surcharges which expire March 31 and repeal of the recapture provisions of the Transportation act. In the Middle West the carriers are

The Steel Industry—

confronted with a demand from the iron and steel industry for reduced freight rates to the large consuming area of Detroit.

Being an independent agency, the commerce commission pursues policies which are basically laid down by congress. Nevertheless, no commission would be unresponsive to a broad program discreetly suggested by the White House. So the incoming President has within his grasp an unwritten but a very real power to formulate policies concerning the regulation of the railroads.

The question is being asked in many quarters, what will become of the department of commerce under the new administration, especially in view of the fact that the department as it now exists is practically a creation of President Hoover who certainly brought it to its present state of efficiency. It seems that he future of the deparment rests largely on the type of man selected as its head.

Those in close touch with the incoming administration do not believe, that the commodity divisions as developed by Secretary Hoover will be abolished, and it is practically certain, unless the new secretary of the department believes in the spoils system, that the present chiefs of these divisions will be retained in their positions.

However, from the secretary down, it is quite certain that the principal offices in the department, such as the commissioner of patents, the director of the bureau of the census, the director of the bureau of foreign and domestic commerce and similar offices will be filled by "deserving" Democrats.

Questions of this kind can only be answered, however, when it is learned just what type of man comes in as head of the department. As a rule, the cabinet officer is given a fairly free rein concerning his assistants.

There is some talk that the new administration may propose to reorganize the federal trade commission, seeking legislation to effect this, possibly at the session of congress beginning next December.

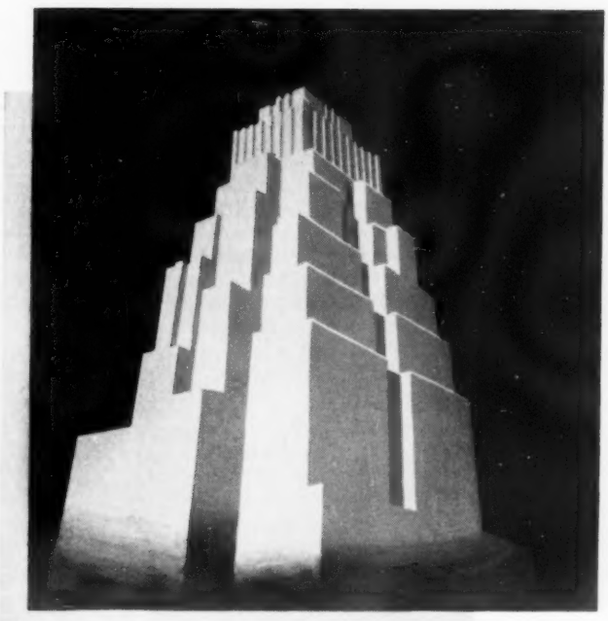
It will be recalled that the trade commission was a conception of President Wilson, who visualized a federal body which would not only protect the small business man from the encroachment of big business but also be a sort of haven to which business men could go with their plans and obtain counsel whether or not they were in danger of running afoul of the various antitrust laws.

But the enabling legislation of a Democratic congress fell short of this goal. During the war the commission was largely a wartime agency. In the early days of the Harding administration it sought to police business, among other things attempting to force producers of iron, steel and coke to submit monthly reports of production costs. Taking the commission to court, the industry won.

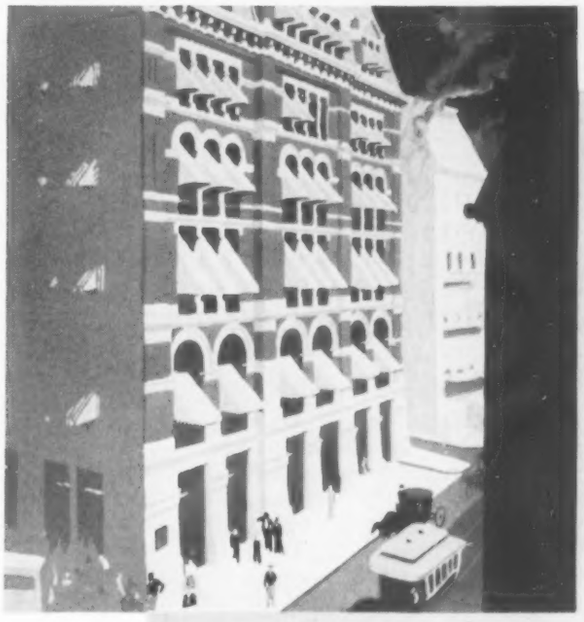
The steel industry best knows the trade commission for its proceedings which resulted in an order to abandon the Pittsburgh-plus pricing method in 1924. Under the Coolidge administration, the commission became more conservative, and its chief contact with the iron and steel indus-

(Please turn to Page 77)

Steel Essential To Modern American Architecture



1933



1900

CONSIDERING what steel has meant to American building architecture thus far in the twentieth century, can anyone with sanity suggest that the nation will go back to the steelless buildings of 1900 and before? Steel consumption per square foot of building space has mounted steadily, especially in the past 10 years. Whether future development calls for further refinements in skyscrapers or in the creation of a more modest type of structure along European lines, steel will be essential, not only for framing, interior trim and exterior adornment, but also in increasing volume for the services of heat, ventilation, water and sanitation and for furniture and equipment. One of the pressing problems that is now confronting the industry is to cultivate this market more intensively

The Steel Industry—

Capital "Buried" in Heavy Raw Material Reserves?

SEVERAL of the problems of important influence on the future of the steel industry concern raw materials, chiefly coal and iron ore. They had their origin in the World war, with over-expansion in coal and iron mine capacity. Prosperity tended later to allay misgivings, and then with a new era of mergers steel companies appeared more eager than ever to possess sources of supply.

So far as coal is concerned, it now is a question whether steel companies did not acquire too much, and if it would not be a better policy, in view of supplies in this country, and necessary economic adjustments, to relinquish a large portion of it. Some companies' coal reserves are estimated sufficient for more than 100 years; years in which taxes and interest must vitiate certain advantages in holding them.

The country's coal far exceeds that of good grades of iron ore; hence, there was more justification for building ore reserves. Here, however, a semi-socialistic system of taxation is imposing a terrific burden, iron ore taxes in 1932 exceeding the value of the pig iron made with the ore. In Minnesota the state tax commission has just ruled against a reduction in valuations.

The following two articles show the industry's position as regards coal and iron ore, indicating the problems which must be solved satisfactorily before it can adjust itself for the years ahead.

Consider Relinquishing Coal Mines

By R. H. SWEETSER*

ELEVEN per cent of this country's capacity for producing bituminous coal—the fuel on which the steel industry now chiefly depends—is owned or controlled by iron and steel companies.

Thirty-one of these companies, with so-called "captive" mines, have a steel ingot capacity of 65,154,125 gross tons annually. Their coal mine capacity is 85,744,000 net tons, equivalent to 2632 pounds of coal per gross ton of ingots.

This ratio of coal to ingots heretofore has not been considered excessive, but the steel companies now are giving more thought to capital tied up in coal reserves, a considerable portion of which cannot be used for many years, and in some instances not before the lapse of a century.

What led the companies to acquire such reserves? Previous to the World war many purchased coal properties to supply a portion of their requirements—it was the tradition that steel was built upon the double foundation iron ore and coal. During the war, and again in the two emergencies in the coal industry, it became more difficult for steel producers to obtain coal of good quality and at fair prices. Gradually, they acquired more coal lands, some of it at peak prices.

Some steel executives now believe the two greatest sources of complaint of the steel industry in procuring coal from the coal operator, instead of from captive mines—irregular delivery and poor quality—have been removed. Coal-carrying railroads now have adequate car supply and dependability of service, and coal operators have yielded to insistent demands for high quality coal; they have given much attention to better mining and to the cleaning of coal.

This state of affairs in the industry is largely due to the entrance of steel companies into the coal fields. When it was noted that the steel companies were spending millions of dollars for coal-cleaning plants, and mining coal by safer methods and under better living conditions, then the coal industry realized its need for producing better coal, and for studying the fitness of their own products in their natural markets.

Is it desirable, then, that steel corporations should dispose of their coal properties and rely upon independent operators? This question cannot be answered for the whole iron and steel industry; each individual case must be studied and decided separately, and that is what is being done today.

Progress in Engineering

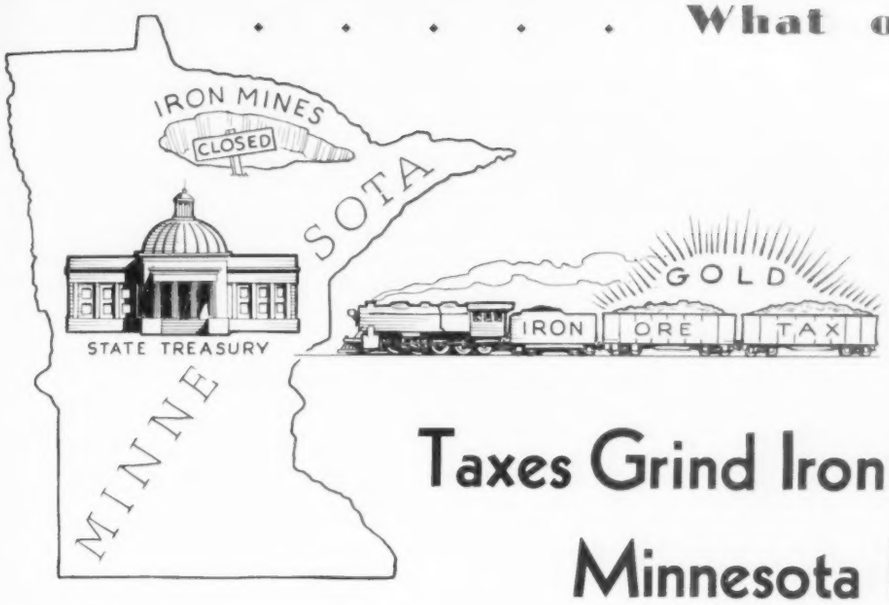
A few steel companies may decide to go further into the coal industry. Seventeen, with a total ingot capacity of 4,065,000 tons, have no coal mines, though one of these is owned by a large corporation possessing many mines. Ten companies with a total ingot capacity of 2,347,500 tons use either oil or natural gas in their open hearths. Twenty-three blast furnace companies, owning 38 merchant stacks, with annual capacity for producing 4,937,000 tons of pig iron, do not own coal mines.

Progress in fuel engineering has disclosed to some captive-mine owners that their reserves are not best suited to their requirements, and in such instances an exchange of coal properties evidently would be desirable, or the exchange for a good coal contract.

In dealing with the financing of steel corporations, bankers have demanded reserves that will outlive mortgage bonds. Coal and iron ore reserves have been among the steel industry's chief assets. But steel companies are taking another look at this question, and considering the effects of taxes, interest charges, and ever-changing technical progress that gets more and more energy from a pound of coal. It appears to them that it is possible to provide unwisely too far ahead for coal on the present basis of requirements for a ton of steel ingots.

*This is a brief abstract from an article prepared for STEEL, which will appear in full in an early issue.

. . . . . **What of Its Future?**



IRON ore producers must pay the equivalent of 27 tons of gold in taxes to Minnesota for 1932, in which year they shipped only 2,300,000 tons of ore from the state. Taxes exceed the total market price of the pig iron that could be made with such a quantity of ore

Taxes Grind Iron Ore Industry; Minnesota Refuses Relief

By A. J. HAIN
Associate Editor, STEEL

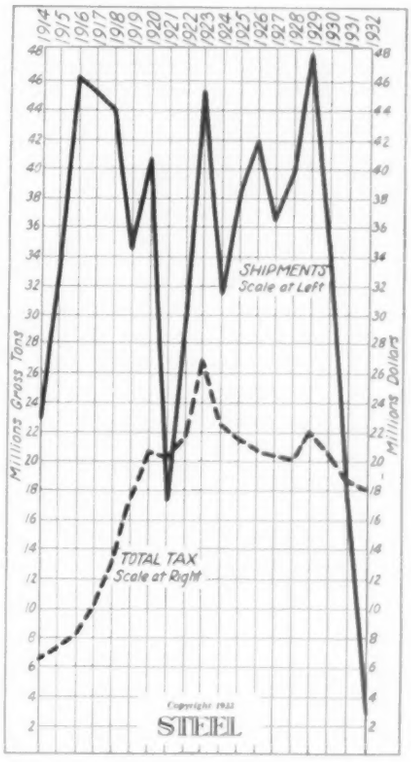
DETERMINED efforts are being made by the Lake Superior iron mine operators to obtain a reduction in taxes. This question is of the utmost importance to the iron and steel industry, as to a great extent iron and steel prices in the future will depend upon it. In the mining industry during 1932 practically all other problems were subordinate to that of taxes. A vigorous campaign was conducted in Minnesota to convince the state officials that their policies are destroying mining enterprise.

Under normal conditions, a severe burden was imposed upon the industry by excessive public expenditures, and outright discrimination against mines in Minnesota. With demand for ore diminished as in 1931 and 1932 the tax load became almost insupportable.

A few moments' consideration of the Minnesota state tax commission's own figures will indicate the magnitude of taxes, in relation to ore and pig iron prices. In 1931 the operators shipped 17,309,200 tons of ore from the state, and paid in taxes $18,650,100. In 1932 shipments dropped to 2,300,000, and the tax bill, unless revised, stands at $17,965,645. The average for the two years is $1.86 for every ton of ore shipped from the state.

The commission's latest report discloses the average cost of producing ore, 1926-1929, was $1.335. This covers a period in which unit costs were relatively low because shipments were large. The cost figure includes development, labor, supplies, royalties, administration, depreciation; but not taxes or interest on capital.

It must be considered, also, that no industry's affairs are more open to public inspection than mining in Minnesota. It is necessary for the commission to make a thorough investigation, from the tonnage and character of the ore, which lies open to view, to the companies' books which must be made available. The commission has experts in mine accounting; it has experts in minerology and mining, through the facilities of its own department, and the state's school of mines. No discovered ore escapes assessment; costs cannot be "padded."



Total taxes, in dollars, paid by the iron mining industry in Minnesota, compared with total iron ore shipments, in gross tons, from the state

The average tax for the two years is $1.86. The mining cost is approximately $1.335—a figure taken because it is the latest official, though probably less than actual for the past two years. These combined equal $3.195. Against this must be considered the commission's average value of the ore at the mine. This ranges from $2.71, for Mesabi nonbessemer, representing 60 per cent of the ore shipped from the state, to $3.01 for old range bessemer.

The simple fact is that the commission's own figures show that total costs—of which taxes constitute 58 per cent—are higher than the value of the ore at the mine. Its mine values are based upon published open market prices, when practically all the ore is sold on long-term contracts, at a discount of 15 to 25 cents or more per ton.

The quoted price of ore has remained unchanged for four years mainly because in the last three years there has been little demand. If anyone had really desired to buy ore in quantity during this period, the price certainly would have been materially less than the nominal market quotations. Such reductions only serve to increase the discrepancy between prices and costs.

Tax per ton in the past two years in Minnesota has been more than six times greater than labor cost under normal working conditions. With relatively heavy shipments in the years 1923-1930, the tax averaged

55.8 cents, or 80 per cent over the labor charge.

In 1932 when ore shipments shrank to the lowest point in 47 years the tax assumed fantastic proportions, averaging about $7.80 per ton. One company's tax bill in Minnesota for the year is equivalent to 4 tons of gold—and the "irony" of it is the company did not ship a ton of ore from the state. Unless relief is granted before the 1932 taxes fall due the industry will be called upon to pay $17,965,600, an amount equal to approximately 27 tons of gold.

Shipments from the state last year were only 2,300,000 tons. It is a curious coincidence that the state wants to take in taxes an amount more than the market value of the pig iron that could be made from such a tonnage of ore. The equivalent in pig iron is 1,241,000 tons, and the price of iron at Lake Erie furnaces during the past year was around $14 a ton, or $17,374,000 for the iron that could be made from the ore.

Stocks Are Heavy

Volume might rescue the ore industry from its plight, but such volume does not appear immediately in view. The best-informed in the industry today confess themselves at a loss to know what shipments will amount to in 1933; while assuming that there will be some increase, they believe it will be moderate. Winter operations to provide work will further build stocks in the Lake Superior district, which in turn may retard operations during the summer this year. It is now estimated that there will be in stockpile at mines and lower lakes about 48,000,000 tons of Lake Superior ore on May 1, 1933. At the present rate of consuumption this is sufficient for 5 years.

Minnesota's tax policies may be leading to socialization of the mines. The purpose evidently is not there, but the effect may be the same. The state has long held the whip-hand, and the operators have been compelled to pay. But, suppose they should be forced to say: "We cannot pay!" Either those communities which have been lavish with iron ore tax money would have to yield; the banks that hold their warrants and bonds would have to insist on a new deal, and the state as a unit would have to change its attitude, or the alternative would be for it to take the properties, and offer them for sale, the buyer to assume the taxes that a well-organized industry could not pay. A final resort would be for the state to operate the mines—something that it could not possibly do, profitably, in competition with other sources, including foreign, that would be built up.

The assumption that it may have to take the mines is not so far-fetched when it is considered a number of mining companies will probably be forced to default on payments, and not one of them could withstand the siege of high taxes and low output much longer. Socialism does not need its own system to gain some of its own ends; it can attain them through taxes, up to a certain point.

This is the iron ore tax situation as it exists in Minnesota today. Operators' chief cause for complaint is not against the formula for determining mine values, which probably is as scientific as any yet proposed, but with the system of assessing those values. The state has set up several separate classifications for assessing property, and iron ore heads the list. It is assessed at 50 per cent of its full value. Platted real estate is down for 40 per cent; unplatted real estate 33 1/3 per cent; household goods 25 per cent; agricultural products and machinery 10 per cent.

The operators contended that the state tax authorities have been grossly over-valuing mines, while being lenient with respect to platted and unplatted property, resulting in discrimination against ore, right at the start. Besides, however, the state has singled out the ore industry for an occupation tax, amounting to 6 per cent on the difference between cost and market price. And then there is a tax on royalties, which the legislature evidently intended to be paid by those who receive the royalties, but which has fallen on the operators under lease terms specifying payment of all taxes.

Charge Discrimination

Operators contend that since 1920 the assessed value of unplatted property has been reduced 40 to 50 per cent, and that reductions have been made in other classes, but none on iron ore, though ore was worth $1.65 more per ton at the mine in 1920 than in 1931 or 1932. They have been fighting for a uniform rule for general property taxation, and the abolishment of special taxes. In the hearing before the tax commission in St. Paul, in October, they made a strong plea for a 20 per cent reduction in valuation on mining prop-

They claimed that even this much would not correct the irregularities existing between mines and other property, nor would it bring mines down to their actual values figured under peak conditions. The state authorities, however, have arbitrarily denied even this relief to mining property.

"It is important," says the commission, "that no hurried or makeshift general revision of the existing basis for determining the taxable value of unmined iron ore should be undertaken until further examination of some of the mineral deposits by our mining engineers and until after a careful analysis and consideration of the voluminous testimony offered at the hearings may be made.

Valuations, reserves and number of iron ore operating properties in Michigan, from a graph compiled in 1932 *by the state's geological survey division. Though the line representing active mines is carried up to the column for* 1932 *the figure represents the mines active in the calendar year* 1931; *a further reduction occurring in* 1932

all of which would require more time than is now possible to give them."

More than three-fourths of the mining companies' tax money goes to defray county and local government expenses where the mines are located. It would seem, therefore, that the state would not permit a situation where a basic industry was overburdened with taxes, chiefly for the benefit of the local communities. But such is not the general political attitude; rather is it that the mines not only should support those communities, but contribute generously to the remainder of the state, as well. The mines pay 20 per cent of all taxes received by the state.

Mining companies claim that the state by over-assessing them has given the local communities a false sense of values, thus fostering extravagance —and there is much evidence to support their claim.

As an example, they pay more than 95 per cent of the taxes raised in the mining communities. Hibbing with a population of 15,000 has as much tax money to spend as Duluth, with over 100,000 inhabitants. The average per capita tax in all the mining communities in the state is approximately $300; in all the remaining portions of Minnesota, only $40. Through some magic, the cost of government in the mining towns is more than seven times as high as in other communities not blessed with iron mines.

"Farmer in the Saddle"

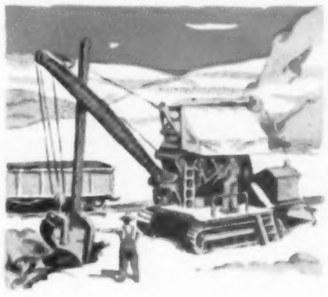
Innumerable instances of the rankest kind of extravagance have been pointed out, to no avail. Some of them are incomprehensible unless the reason be assigned to questionable motives. Citation of only a few of them would serve no useful purpose here. Business methods are said to be extremely lax; many of the communities pay contractors, and other obligations, with tax warrants, in anticipation of taxes. These warrants are discounted 15 per cent at the banks. The consequence is that contractors and others, to get dollar for dollar, put up their prices 15 per cent—a vicious cycle that would not be tolerated in a business-like community.

"The plain truth is that the wealth of the Mesabi range has corrupted the political moralty of the state," said R. C. Allen, president, Lake Superior Iron Ore association.

"The taxation of a dollar invested in a mine at double the rate of a dollar invested in a farm, and at 50 per cent more than a dollar invested in an office building is a political expression of the fact that Minnesota is an agricultural commonwealth. The farmer is in the saddle, and laughs at his apologists."

Investigating tax problems in the United States, the National Industrial Conference board found that the tax on the Minnesota mining industry is approximately 10 times as great proportionately, as that paid by the mining industry as a whole in this country.

At the present time, the annual tax bill of the mining companies in Minnesota is over three times as much as in 1913, although the ore in reserve has decreased over 200,000,000 tons. Since 1929 there has been a tremendous shrinkage in values, but no change in the basis of valuation placed by the state on the mines. It is self-evident that until this situation is rectified there can be no important development work.



Michigan is more reasonable in its treatment of the iron mining companies, though the latter claim assessments still are extremely excessive, and they have been pushing for reductions. The formula used for determining iron ore values is much the same as in Minnesota.

Because of the age of some mines, high costs and slack demand, pumps have been pulled and they have been permitted to fill up with water. A large part of the reserves are high in phosphorus for which there is little demand. These so-called "captive" mines, if not owned by consuming interests that can find some use for the material, would not be worked.

Reduction in Michigan

Furthermore, the public attitude toward mining companies in Michigan appears to be more co-operative than in Minnesota. There are no special taxes; mining communities have cut their budgets; there is less evidence of extravagance.

The state mine appraiser in 1932 recommended reductions, and after hearings the tax commission reduced the value of idle properties 10 to 15 per cent, and made a smaller cut on active mines. The result was a total assessed valuation of $77,738,000 in 1932, compared with $89,984,000 in 1931. By contrast total valuation of Minnesota iron mines is approximately $460,000,000 these covering properties of all description.

Business Recovery To Gage Roosevelt Administration

(*Concluded from Page 73*)

try has been the writing and approval of trade practice codes.

Like the interstate commerce commission, the terms of the five members of the trade commission are for seven years, and since it is a bi-partisan body no more than three members can be of the same political complexion. The term of Charles W. Hunt, Republican, of Iowa, expired Sept. 25, 1932, and the President has not attempted to make a recess appointment, with rejection being a certainty.

Roosevelt Can Appoint Four

Other members of the commission, and the expiration of their terms, are: Edgar A. McCulloch, Democrat, Arkansas, Sept. 25, 1933; G. S. Ferguson Jr., Democrat, North Carolina, Sept. 25, 1934; Charles H. March, Republican, Minnesota, Sept. 25, 1935; William E. Humphrey, Republican, Washington, Sept. 25, 1938. If the commission be not entirely upset, the Roosevelt administration thus can appoint four members, of which three may be Democrats, in the next four years.

Officially, of course, the trade commission can take no cognizance of rumored impending changes in its setup, and it has renewed its proposal to congress, as in past years, that its organic act be amended to put beyond question the grant of specific authority to the commission to make investigations upon the request of the President or by either house of congress in furtherance of its legislative function.

The commission feels, it is stated, that such an amendment would remove any existing doubt as to the applicability of section 6(d) of the organic act of the commission, providing for investigations of alleged violations of the antitrust acts, upon the direction of the President or either house of congress.

In a recent publication dealing with its work the commission states regarding the small business man that "the commission offers a tribunal through which the small business concern, possibly aggrieved and threatened by that 'flagrant oppression' at the hands of a powerful rival, mentioned by the Supreme Court, may effectively and without expense, assert its rights."

EDITORIAL

Important Objectives For Steel in 1933

RARELY in modern industrial history has complacency been subjected to the violent shocks that have characterized the last 18 months. At times it has seemed as if a maleficent moratorium had been placed upon traditional standards of value and accepted rewards for meritorious achievement.

Yet out of this apparently topsy-turvy situation there is emerging a fine spirit of determination to beat the depression at its own game. Speaking generally, management finally has regained its composure, has its feet solidly on the ground and—perhaps for the first time since 1929—is working toward definite objectives.

The new will to win is exemplified in the vigor and thoroughness with which hundreds of companies—large and small—are readjusting capital structures, personnel and methods to the requirements of this stage of reconstruction. It is apparent in the wholesale reorganization of the United States Steel Corp., which involved not only a major financial operation in 1928, but also drastic changes in personnel, realignment of operating and advisory functions, gradual abandonment of its more obsolete plant and equipment and numerous other adjustments which came to a climax in 1932. The same spirit is manifested by numerous manufacturing companies which are simplifying their financial set-ups, dropping high-cost departments, concentrating operations and sales, and cleaning house generally.

Thorough House Cleaning Is First Step in March Toward Reconstruction

By virtue of these measures, the companies that are adopting them can look at 1933 with the feeling that, come what may, they will receive greater rewards per unit of business volume than in 1932. Also, most of them are assured of re-entering the area of profits at a rate of operations decidedly below that prevailing at the time they went from black to red ink in 1931 or 1932. Many concerns whose profits disappeared when business dropped below 60 to 65 per cent of capacity, may find it possible to operate profitably at 40 to 45 per cent.

House cleaning is a start in the right direction, but it is only a step in the path of reconstruction. For those who have their houses in order, 1933 probably will be a year of rehabilitation. In contrast to 1932, which was devoted largely to tearing down dead wood, to retrenchment and to other negative action, the new year will be one of rebuilding for the future.

Here the steel industry faces its most important, immediate problem. The stage is set for positive action in regard to plant and equipment, operating technic, merchandising and sales, and research. It is not too much to say that in a broad sense the future of steel will be influenced strongly by what the industry accomplishes constructively in the next year or two.

Physically the industry is in bad shape. Probably not over 35 or 40 per cent of the finishing mill capacity is capable of competing in a low price market. Scores of companies must replace existing obsolete equipment in order to operate profitably. Here and there will be found companies which are losing ground competitively because the quality of their products is deteriorating due to their effort to get along with hopelessly outmoded facilities.

Simplifying Price Structure Will Smooth Way for Steel in Future

In merchandising and sales the industry faces one of its most difficult problems. The confusion arising from the present methods of quoting prices is a real deterrent to effective selling. Concessions to preferred customers, abuse of the fabrication-in-transit feature of freight rates, the fact that prices of certain products can be figured on three or more bases with several different prices resulting, and the price problem existing in relation to mills and fabricators and to mills and warehouses all are troublesome details of a complicated price structure that has grown without proper guidance. To the credit of the industry, it can be said that more progress was made in 1932 in approaching the solution of some of these problems than in any recent year. But until the more glaring inequalities of the present system are ironed out, the marketing of steel will continue under serious handicaps.

Several other major tasks could be enumerated, but in these two, namely rehabilitation of equipment and simplification of price structure, the industry will find abundant opportunity for improvement in 1933. Satisfactory progress toward these important objectives, especially in the current year, will do more to reestablish steel on a sound footing than any other factors now within the control of those who rule the industry.

THE BUSINESS TREND

Strength of 1932 Resistance Augurs Well for 1933

NINETEEN thirty-two was unkind and kind to the business trend. The worst that can be said of it is that important barometers dropped to the lowest levels of this century. The best that can be vouchsafed is that it ushered in an impressive halt to the decline.

Daily average pig iron output in July and August of 1932 was the lowest since November, 1896. Steel ingot production in the mid-year months was at the lowest rate since monthly records have been maintained. Bradstreet's commodity price index touched a low of $6.68 in June, necessitating a search back to July, 1898, for the nearest parallel. Comparisons with the 10-year average, as charted herewith, also emphasize the depth of the 1932 valley.

Fortunately much of the drab significance of this record is offset by the upturn in business which occurred in late summer and autumn. Strengthening of livestock prices about July 1 was the signal for a general turn in commodity prices, which carried price barometers upward for four months, and was followed by an expansion in industrial activity in August, September and October. Prices and production tapered off in November and December, but at the date of this writing, part of the fall gains had been retained.

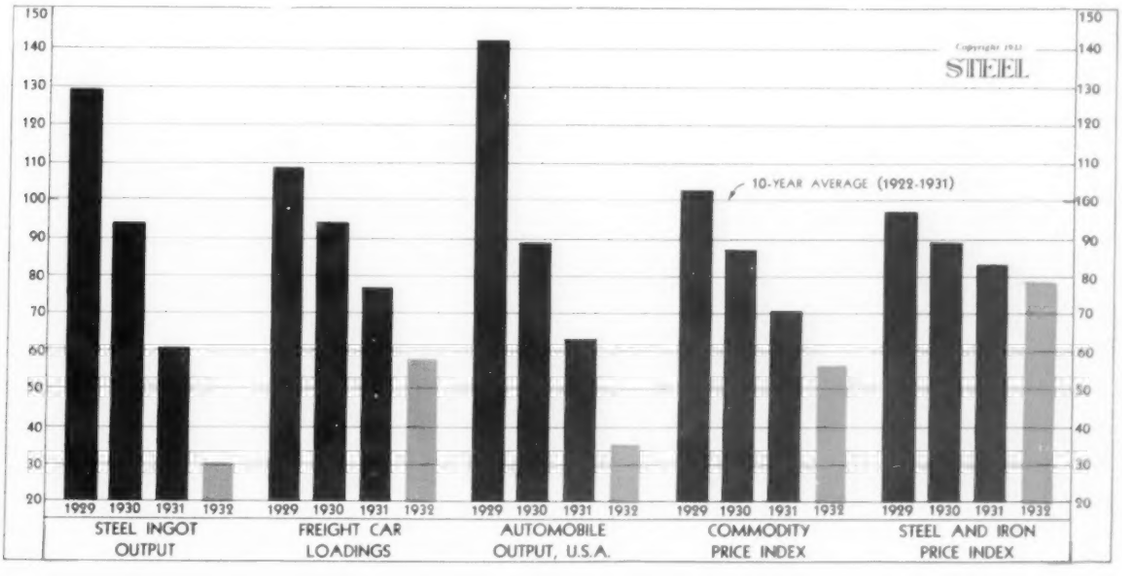
That the 1932 rise was more impressive than that of early 1931 is shown by the following:

1931	Industrial Production	Commodity Prices	1932	Industrial Production	Commodity Prices
Jan.	83	$9.51	June	59	$6.68
Feb.	86	9.31	July	58	6.73
Mar.	87	9.17	Aug.	60	6.80
Apr.	88	9.23	Sept.	66	7.17
May	87	8.91	Oct.	66	7.27
June	83	8.64	Nov.	63*	6.96

*Estimated

The gain of 8 points in production in 1932 compares with one of only five in 1931. The rise in commodity prices for four consecutive months in 1932, amounting to 59 cents, compares with a one-month gain of 4 cents in 1931.

That the most determined resistance yet presented was staged in 1932 and that part of its force still is effective are hopeful signs for 1933.



The Statistical Record of 1932 in Tabloid

	1 Industrial Production Adjusted Index	2 Employment Mfg. Industries Index No.	3 Car Loadings Weekly Ave. 1000 Cars	4 Electric Power Production Daily Million K-W-H	5 Wholesale Comm. Prices Bradstreet's Index Dollars	6 Steel, Iron Prices Steels' Composite Dollars	7 Commercial Failures Dun's Number	8* U. S. Steel Corp. Earnings (gross) 1,000,000 Dollars	9 R. R. Class I Net Income 1,000,000 Dollars	10 Unfilled Orders U. S. Steel Corp. 1000 Tons	11 Pig Iron Monthly Output 1000 G. Tons	12 Steel Ingots Monthly Output 1000 G Tons
January	72	64.8	567	243.3	7.73	29.98	3,458	....	11.71	2,648	971.4	1,459.4
February	69	65.6	561	241.4	7.52	29.56	2,732	....	22.04	2,546	960.5	1,457.7
March	67	64.5	565	235.5	7.32	29.61	2,951	—13.22	32.29	2,472	967.0	1,409.0
April	63	62.2	557	226.0	7.15	29.75	2,816	....	20.62	2,327	855.7	1,238.2
May	60	59.7	522	214.0	6.92	29.62	2,788	....	11.95	2,177	783.8	1,106.0
June	59	57.5	491	218.3	6.68	29.54	2,688	—20.45	12.65	2,035	626.0	897.2
July	58	55.2	483	210.5	6.73	29.47	2,596	....	11.60	1,966	570.2	792.5
August	60	56.0	525	217.4	6.80	29.32	2,796	....	23.37	1,970	528.1	832.4
September	66	58.5	561	224.6	7.17	29.32	2,182	—20.87	49.65	1,985	593.6	975.1
October	66	59.9	632	227.2	7.27	29.32	2,273	....	47.34	1,997	644.6	1,068.6
November	..	....	549	.....	6.96	29.12	2,073	....	....	1,968	625.7	1,014.8
December	..	....	....	.....	6.89	28.91	.....	.....	.....	.....	.....	.....
Ave. 1932	64	60.4	547	225.8	7.10	29.46	2,669	—18.18	24.32	2,190	738.8	1,113.7
Ave. same period, 1931	83	73.3	729	251.8	8.76	31.15	2,321	14.15	47.20	3,532	1,571.1	2,171.9
Ave. 12 mos. 1931	81	72.2	716	251.2	8.76	31.15	2,357	11.62	43.88	3,470	1,521.9	2,099.4
Monthly ave for 10 years	101	94.4**	933	206.8	12.36	37.34	1,922	420.85	81.11	4,277	2,812.6	3,483.3

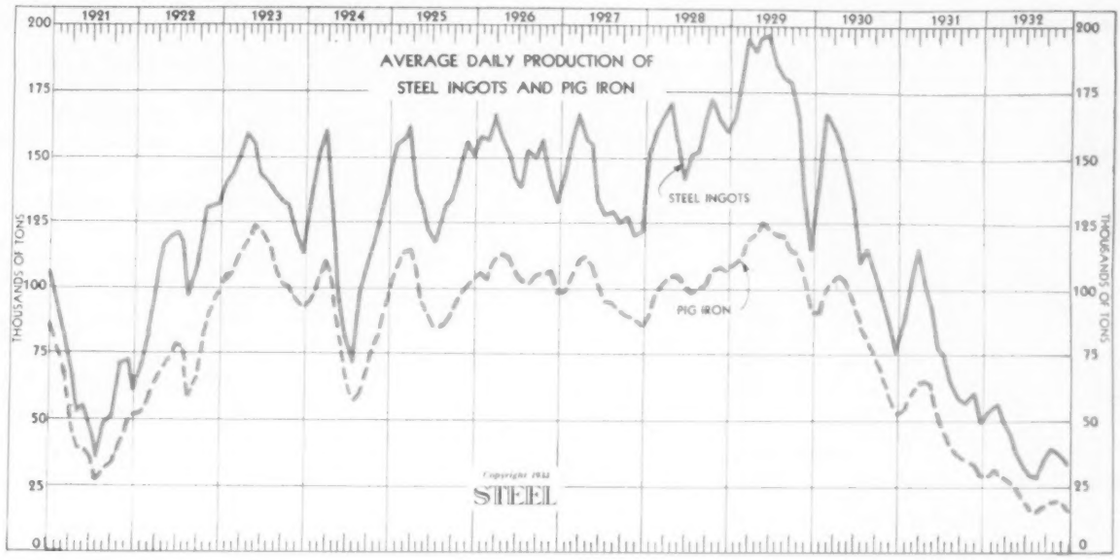
*Quarterly figures. **Monthly average last 9 years.

	13 Bitum. Coal Monthly Output 1,000,000 Net Tons	14 Coke Monthly Output 1000 Net Tons	15 Steel Castings Monthly Output 1000 Net Tons	16 Mall. Castings Monthly Output 1000 Net Tons	17 Gray I. Castings Ave. Output Per Fdry. Net Tons	18 Fab. Str. Steel Monthly Orders 1000 Net Tons	19 F. Plate Work Monthly Orders 1000 Net Tons	20 Steel Sheets Monthly Output 1000 Net Tons	21 Flat Enameled Ware Monthly Shipments 1000 Doz.	22 Steel Furniture (Business) Monthly Orders $1000	23 Steel Barrels Monthly Output 1000 Units	24 Railroad Track Work Output 1000 Tons
January	27.89	2,189	18.4	22.2	70	48.4	17.6	118.9	198.9	967	359.7	2.9
February	28.01	2,082	18.8	21.6	71	62.4	17.8	124.1	270.2	751	367.5	2.8
March	32.25	2,177	20.0	19.6	69	64.4	12.6	110.6	276.7	794	452.2	3.2
April	20.30	1,939	17.5	16.8	67	64.8	14.1	101.6	195.5	689	447.4	3.3
May	18.38	1,788	14.5	17.4	77	90.8	11.8	96.2	193.4	634	434.1	3.1
June	17.75	1,578	12.8	15.1	65	86.8	18.4	85.2	178.3	655	651.9	2.0
July	17.86	1,562	11.5	9.7	59	69.2	12.5	60.9	170.0	554	352.6	1.9
August	22.49	1,515	12.3	7.0	65	78.8	11.9	57.4	††	574	362.9	1.8
September	26.27	1,590	11.3	10.2	78	111.2	11.0	89.8	††	551	395.6	1.4
October	32.68	1,806	12.5	12.6	78	74.4	16.7	108.1	††	577	422.6	1.2
November	30.63	.....	.....	.....	...	.....	.....	.....	††	...	.....	.....
December	...	.....	.....	.....	...	.....	.....	.....	††	...	.....	.....
Ave. 1932	24.96	1,823	15.0	15.2	70	75.1	14.4	95.3	212.0	675	424.6	2.4
Ave. same period 1931	31.62	2,904	39.2	26.8	109	171.8	26.8	168.6	270.7	1308	514.9	5.7
Ave 12 mos. 1931	31.51	2,811	36.4	26.0	103	156.7	25.2	157.5	261.7	1,242	498.7	5.1
Monthly Ave. for 10 years	41.31	4,102	82.1*	57.8**	172†	231.6	40.9**	251.9	321.3‡	2,890°	553.6°°	12.7**

*Monthly average last 6 years. **Monthly average last 9 years. †Monthly average last 3 years. ‡Monthly average last 5 years. °Monthly average last 4 years. °°Monthly average last 8 years. ††Statistics discontinued.

	25 R. R. Cars Monthly Awards Units	26 Auto's U. S. A. Monthly Output 1000 Units	27 Building Construction Monthly Awards Million Sq. Ft.	28 Machine Tools Monthly Orders Index No.	29 Foundry Equip. Monthly Orders Index No.	30 Electric Overhead Cranes Monthly Orders $1000	31 Steel Boilers Monthly Orders Units	32 Ship-building Completed 1000 Gross Tons	33 Iron and Steel Foreign Trade Exports 1000 Tons	34 Iron and Steel Foreign Trade Imports 1000 Tons	35 U. S. Foreign Trade Merchandise Exports Million Dollars	36 U. S. Foreign Trade Merchandise Imports Million Dollars
January	159	119.3	12.60	59.2	20.5	65	282	2.91	40.7	31.0	150.0	135.5
February	35	117.4	12.30	54.8	32.9	56	204	3.70	40.5	26.7	154.0	131.0
March	105	119.0	16.92	43.1	27.9	52	264	41.99	49.9	41.0	155.3	131.2
April	0	148.3	13.89	37.1	13.8	31	239	17.53	58.1	36.3	135.4	126.5
May	60	184.3	15.74	37.5	18.5	47	263	26.26	80.5	39.7	132.2	112.3
June	0	183.1	12.30	39.1	14.2	61	328	10.78	52.1	34.5	114.3	111.4
July	25	111.1	14.40	33.8	18.7	13	329	28.34	52.6	18.0	107.0	79.0
August	5	90.3	13.86	30.3	18.6	37	401	2.70	32.9	23.6	109.2	91.1
September	1,298	84.1	13.51	27.7	11.9	67	443	10.27	36.0	29.2	132.0	98.0
October	0	48.9	11.03	28.4	23.2	31	379	22.79	41.2	33.7	153.0	106.0
November	2	....	12.07	29.6	13.8	36	....	....	....	....	139.0	104.0
December	....	....	....	....	....	....	....	....	....	....	....	....
Ave. 1932	154	120.6	13.51	38.2	19.5	45	313	16.73	48.5	31.4	134.7	111.4
Ave. same period 1931	971	219.9	31.70	76.0	54.3	241	711	21.76	77.9	36.0	203.7	176.1
Ave. 12 mos. 1931	891	199.1	30.49	74.1	52.0	227	639	21.99	80.8	27.5	202.0	174.2
Monthly Ave. for 10 years	7000	313.4	63.16*	147.6	125.5	728	1275**	22.59	172.9	51.7	365.0	307.4

*Monthly average last 7 years. **Monthly average last 5 years.


AVERAGE DAILY PRODUCTION OF
STEEL INGOTS AND PIG IRON
STEEL INGOTS
PIG IRON
THOUSANDS OF TONS
1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932
200 175 150 125 100 75 50 25 0
STEEL

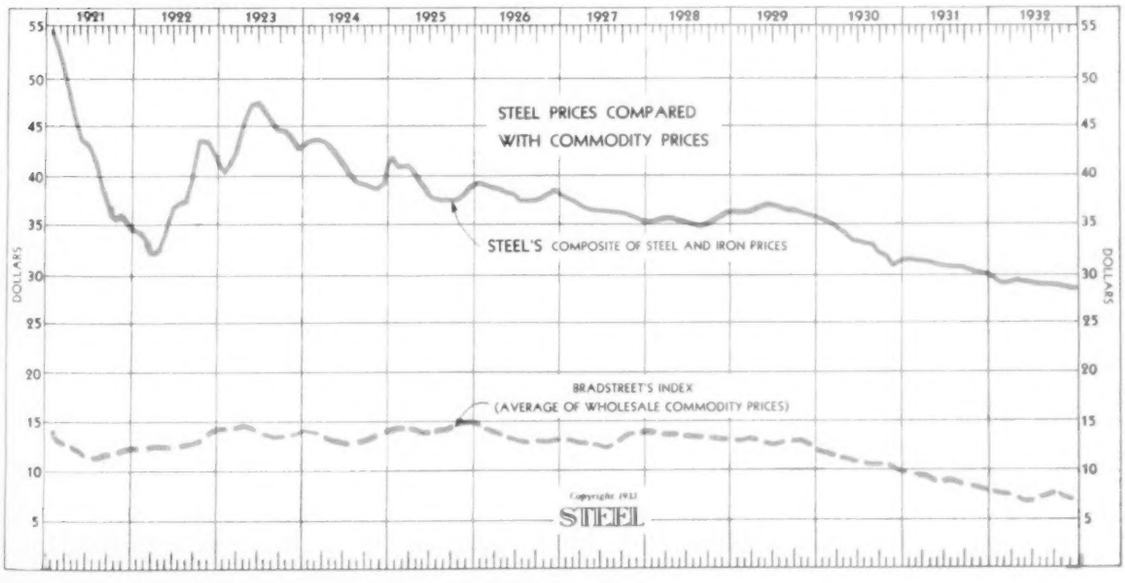
Comparisons Will Be More Favorable in 1933

OF THE 36 business factors for which statistics are presented on the opposite page, not one affords a favorable showing in 1932 compared with 1931. In every case the average indicates a recession from last year.

However, the prospect is not as dark as the foregoing statement would indicate. Examination of the month-to-month trend of the majority of the factors tabulated will show strong signs of resistance; a few important trend lines for 1932 actually have crossed the corresponding lines for 1931.

For instance, consider commercial failures. In October and November, 1932, they numbered less than in the corresponding months of 1931. In the last quarter of 1932 the trend was definitely downward; in the final months last year it was rising. Bituminous coal output is one of the select items wherein 1932 figures for a few weeks have exceeded those of last year.

Statistics of production, with few exceptions, approached nearer to 1931 levels as the year progressed. This was also true of orders and contracts. In the case of many important barometers, a comparatively modest rise in the new year will carry trend lines above the corresponding graphs for the previous year. While this eventually is of little real significance when business generally is at such low ebb, the possibility of comparing current figures favorably with past records will have a beneficial effect psychologically.


STEEL PRICES COMPARED
WITH COMMODITY PRICES
STEEL'S COMPOSITE OF STEEL AND IRON PRICES
BRADSTREET'S INDEX
(AVERAGE OF WHOLESALE COMMODITY PRICES)
DOLLARS
1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932
55 50 45 40 35 30 25 20 15 10 5
STEEL

GREAT BRITAIN	*UNITED STATES*	*FRANCE*	*GERMANY*
249 Pounds	**242 Pounds**	**175 Pounds**	**149 Pounds**

This per capita consumption of steel relates domestic output, adjusted for exports and imports, to population. Revised statistics for 1931 *are: United States* 453 *pounds, Great Britain* 261, *France* 242 *and Germany* 180

World Output Back To Start of Century

THIRTY-three years ago as much pig iron was made in the world as came out of the blast furnaces last year. As much steel was produced 26 years ago as was made in 1932. With the exception of 1921, one must go back to 1908 to find a lower level of world output of steel, and to 1898 to find a lower output of pig iron. Such is the share of the iron and steel industry in the depression that has made 1932 outstanding among critical years.

The tonnage of steel ingots and castings produced throughout the world in 1932 can be estimated at 49,160,000 gross tons, compared with 68,108,000 tons in 1931, and 93,057,000 tons in 1930. As compared with 1931, there was a reduction of 28 per cent. Contrasted with the record year 1929, the decline was 58 per cent. The 1932 total is the equivalent of the American output in 1928.

The world output of pig iron in 1932 was approximately 38,200,000 gross tons, against 54,762,000 tons in 1931, and 78,360,000 tons in 1930. The reduction from 1931 was 30 per cent.

Six years ago, the United States contributed more than half the output of iron and steel of the whole world. In 1932, the share of the United States in steel production was 27.5 per cent, and in pig iron 23 per cent. The drop in United States production compared with 1931 was 47 per cent, and 52 per cent for pig iron.

In Europe, the steel-producing countries were diversely affected. Taking those nations whose output in 1931 had exceeded 1,000,000 tons, Czecho-Slovakia suffered a decline of 52 per cent, Poland 48.5 per cent, Germany 30.5 per cent, France 29 per cent, Belgium 11 per cent, the Saar 5 per cent, Italy and Luxemburg 4.5 and 3.8 per cent respectively. Great Britain's output of steel actually was slightly higher than in the year preceding, but that country already had experienced a severe reduction in 1931.

In steel production, France, Great Britain and Russia ran very close to Germany for first rank among European nations; for pig iron, France led easily with Russia. Russia increased her output in 1932, but did not reach the tonnage which the five-year plan had aimed at. Actually, Russia's rate of production exceeds only slightly that of the period 1914-16.

The five member-countries of the original European steel entente had a combined output of

World Production of Steel Ingots and Castings

Gross Tons

	1932	1931	1930	1929	1928	1927	1926	1925	1924	1913
United States	13,500,000	25,630,000	40,278,000	55,650,000	50,887,000	44,935,000	48,294,000	45,394,000	37,932,000	31,301,000
Canada	335,000	673,000	1,009,000	1,391,000	1,240,000	907,000	782,000	756,000	661,000	1,043,000
Great Britain	5,240,000	5,179,000	7,326,000	9,636,000	8,520,000	9,099,000	3,596,000	7,385,000	8,201,000	7,664,000
France	5,475,000	7,697,000	9,296,000	9,544,000	9,348,000	8,173,000	8,295,000	7,327,000	6,791,000	4,614,000
Belgium	2,745,000	3,073,000	3,300,000	4,066,000	3,872,000	3,645,000	3,320,000	2,508,000	2,829,000	2,428,000
Luxemburg	1,925,000	2,002,000	2,234,000	2,659,000	2,526,000	2,431,000	2,208,000	2,053,000	1,857,000	.....
Italy	1,365,000	1,430,000	1,746,000	2,109,000	1,932,000	1,570,000	1,752,000	1,757,000	1,337,000	919,000
Spain	525,000	594,000	910,000	985,000	770,000	653,000	598,000	616,000	531,000	238,000
Sweden	520,000	530,000	601,000	683,000	567,000	491,000	487,000	467,000	493,000	582,000
Germany	5,655,000	8,159,000	11,354,000	15,986,000	14,285,000	16,050,000	12,145,000	12,000,000	9,678,000	18,632,000
Austria	220,000	317,000	461,000	622,000	626,000	551,000	473,000	462,000	371,000	2,585,000
Czechia	700,000	1,503,000	1,721,000	2,103,000	1,704,000	1,662,000	1,316,000	1,476,000	1,200,000	.....
Poland	525,000	1,020,000	1,217,000	1,355,000	1,226,000	1,226,000	775,000	779,000	667,000	.....
Hungary	120,000	311,000	363,000	505,000	478,000	464,000	320,000	227,000	235,000	.....
Russia	5,500,000	5,264,000	5,610,000	4,828,000	4,206,000	4,150,000	3,087,000	2,087,000	1,122,000	4,181,000
Japan	2,100,000	1,878,000	2,288,000	2,249,000	1,840,000	1,658,000	1,475,000	1,279,000	1,106,000	300,000
India	550,000	625,000	619,000	575,000	410,000	575,000	520,000	449,000	335,000	.....
Australia	450,000	360,000	420,000	460,000	462,000	466,000	338,000	351,000	306,000	.....
Saar	1,435,000	1,513,000	1,904,000	2,174,000	2,040,000	1,865,000	1,709,000	1,554,000	1,423,000	.....
Miscellaneous	275,000	350,000	400,000	400,000	350,000	305,000	175,000	275,000	225,000	200,000
WORLD TOTAL	49,160,000	68,108,000	93,057,000	117,980,000	107,477,000	100,876,000	91,898,000	89,202,000	77,300,000	74,687,000

German figures in 1913 are for pre-war territory. Austrian figures in 1913 include the major portion of Czechia and Hungary. Japan's figures include Manchuria and Korea.

17,235,000 tons of steel. When the entente ceased directly to control production, the authorized output of its members was about 26,000,000 tons. It will therefore be seen that the slump in demand caused producers voluntarily to reduce their aggregate output by 33.5 per cent of the quota fixed by the entente at the end of last year.

Outside of Europe and the United States, the largest drop in steel production was registered by Canada, which country made barely half of its 1931 tonnage of steel and only about 27 per cent of the 1931 output of pig iron. Japan exceeded her 1931 output of steel, but receded with respect to pig iron. Australia's output increased, both in regard to steel and pig iron.

The accompanying table of exports and imports shows a further shrinkage in world foreign trade. Exports of the five major countries were 10,200,000 tons, or 27 per cent less than in 1931. Imports were 32 per cent less than in 1931. It should be noted that the shrinkage in foreign trade in 1932 was not only due to actual trade depression, but also to increases of tariffs and currency exchange restrictions.

In point of per capita consumption of steel, which is domestic production plus imports minus exports divided by population, Great Britain wrested the scepter from the United States for the first time in the history of the modern industry. Per capita consumption of Britain declined only from 261 pounds in 1931, which is a revised figure for that year, to 249 pounds in 1932. The average for the United States, meanwhile, shrank from 453 pounds to 242 pounds. France again was third, at 175 pounds, and Germany fourth at 149 pounds.

Per Capita Production in United States

	Population in thousands	Output Steel Ingots, Castings, gross tons, thousands	Output per capita, pounds	Pig Iron output in gross tons, thousands	Output per capita, pounds
1932	124,822	13,500	242	8,800	158
1931	124,070	25,630	463	18,263	330
1930	122,775	40,278	734	31,441	573
1929	121,500	56,433	1,040	42,614	786
1928	120,013	51,544	962	38,155	712
1927	118,628	44,935	848	36,511	691
1926	117,136	48,294	924	39,372	752
1925	115,378	45,394	881	36,700	713
1924	113,727	37,932	746	31,406	618
1923	111,693	44,943	911	40,361	806
1922	109,893	35,603	726	27,219	554
1921	108,445	19,783	409	16,688	344
1920	106,422	42,132	887	36,926	777
1919	105,003	34,671	739	31,015	661
1918	103,587	44,462	961	39,054	843
1917	102,172	45,060	987	38,621	846
1916	100,757	42,773	950	39,434	876
1915	99,342	32,151	724	29,916	677
1914	97,927	23,513	509	23,332	533
1913	96,512	31,300	725	30,966	717
1912	95,097	31,251	736	29,726	700
1911	93,682	23,676	565	23,649	564
1910	92,174	26,094	634	27,303	663
1900	75,995	10,188	300	13,789	406
1890	62,948	4,277	152	9,202	327
1880	50,156	1,247	55	3,835	171

Exports and Imports of Principal Countries

Gross tons — Scrap eliminated

Country	EXPORTS 1932	1931	1930	1929	1913	IMPORTS 1932	1931	1930	1929	1913
United States	375,000	829,000	1,623,000	2,475,000	2,648,000	350,000	404,000	510,000	649,000	273,000
Great Britain	1,875,000	1,981,000	3,160,000	4,380,000	4,969,000	1,760,000	2,852,000	2,912,000	2,822,000	2,331,000
Germany	2,175,000	3,947,000	4,464,000	5,486,000	*6,200,000	675,000	830,000	1,122,000	1,437,000	*300,000
France‡	2,500,000	3,574,000	4,056,000	4,270,000	640,000	230,000	§378,000	§510,000	281,000	185,000
Belgium & Luxemburg	3,275,000	3,663,000	3,867,000	4,534,000	†1,550,000	260,000	475,000	673,000	986,000	†874,000
	10,200,000	13,994,000	17,170,000	21,145,000	16,007,000	3,275,000	4,939,000	5,727,000	6,175,000	3,963,000

*Includes the Saar and Luxemburg; †Belgium only; ‡Includes the Saar, except for 1913; §From 1930, the French import statistics include materials in temporary admission, which are re-exported after fabrication.

World Production of Pig Iron

Gross Tons

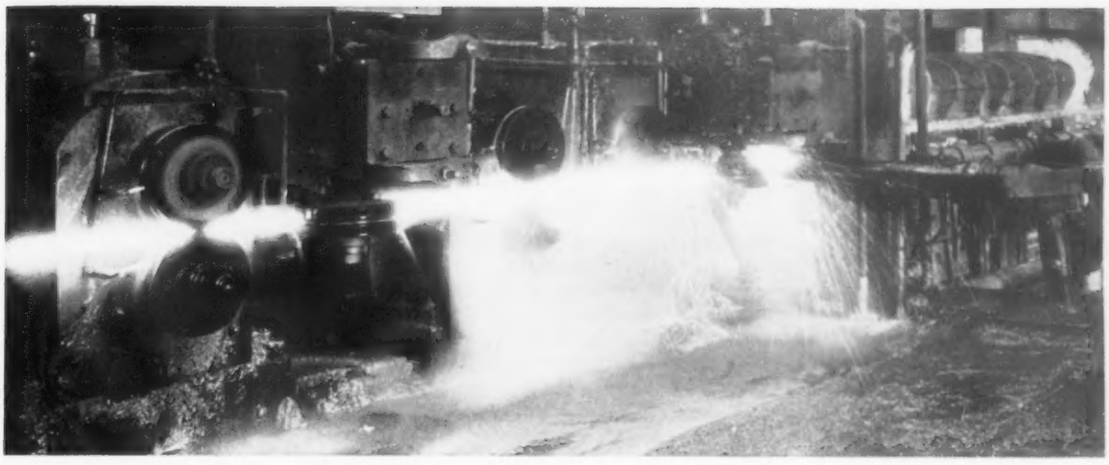
	1932	1931	1930	1929	1928	1927	1926	1925	1924	1913
United States	8,800,000	18,263,000	31,441,000	42,270,000	37,832,000	36,289,000	39,101,000	36,370,000	31,077,000	30,653,000
Canada	125,000	466,000	813,000	1,160,000	1,083,000	760,000	795,000	596,000	619,000	1,015,000
Great Britain	3,600,000	3,758,000	6,192,000	7,589,000	6,611,000	7,294,000	2,458,000	6,262,000	7,307,000	10,260,000
France	5,435,000	8,068,000	9,874,000	10,198,000	9,821,000	9,125,000	9,281,000	8,358,000	7,570,000	5,126,000
Belgium	2,720,000	3,180,000	3,311,000	4,030,000	3,843,000	3,692,000	3,345,000	2,501,000	2,798,000	2,445,000
Luxemburg	1,910,000	2,020,000	2,433,000	2,860,000	2,726,000	2,688,000	2,472,000	2,325,000	2,123,000	.....
Italy	480,000	532,000	569,000	718,000	545,000	487,000	505,000	474,000	299,000	420,000
Spain	290,000	483,000	606,000	740,000	552,000	603,000	479,000	520,000	489,000	418,000
Sweden	270,000	411,000	488,000	516,000	431,000	448,000	493,000	455,000	526,000	730,000
Germany	5,800,000	5,966,000	9,540,000	13,187,000	11,615,000	12,893,000	9,490,000	10,014,000	7,687,000	19,000,000
Austria	100,000	143,000	282,000	455,000	451,000	428,000	328,000	374,000	263,000	2,344,000
Czechia	450,000	1,146,000	1,414,000	1,618,000	1,544,000	1,241,000	1,071,000	1,147,000	967,000	.....
Poland	200,000	341,000	470,000	693,000	673,000	607,000	322,000	310,000	331,000	.....
Hungary	100,000	157,000	253,000	362,000	281,000	294,000	185,000	92,000	114,000	.....
Russia	5,500,000	4,800,000	4,920,000	4,253,000	3,322,000	3,290,000	2,395,000	1,521,000	746,000	4,563,000
Japan	1,200,000	1,385,000	1,635,000	1,491,000	1,520,000	1,263,000	1,160,000	917,000	820,000	236,000
India	900,000	1,072,000	1,180,000	1,348,000	1,055,000	1,145,000	902,000	888,000	877,000	204,000
Australia	400,000	380,000	308,000	420,000	410,000	550,000	442,000	439,000	416,000	47,000
Saar	1,320,000	1,491,000	1,881,000	2,071,000	1,905,000	1,743,000	1,599,000	1,427,000	1,367,000	.....
Miscellaneous	600,000	700,000	750,000	750,000	850,000	750,000	750,000	680,000	450,000	339,000
WORLD TOTAL	38,200,000	54,762,000	78,360,000	96,729,000	87,070,000	85,590,000	77,573,000	75,670,000	66,801,000	77,714,000

German figures in 1913 are for pre-war territory. Austrian figures in 1913 include the major portion of Czechia and Hungary. Japan's figures include Manchuria and Korea.

Ready To Tap at Newburgh

Reproduced by courtesy of American Steel & Wire Co.

—From a Pastel Drawing by F. H. Stickney of a Scene in Newburgh Steelworks of American Steel & Wire Co. in 1928. Interest in This and Other Crayons of Newburgh by Stickney Is Heightened by the Recent Announcement that this Famous Steelworks Will Be Abandoned in 1933.



ENGINEERING PROVES VALUABLE AID TO INDUSTRY IN DEPRESSION YEAR

By E. F. ROSS
Associate Editor, STEEL

EXTREMELY low levels of business and the accompanying need for economy in operation left their imprint upon engineering progress in the iron, steel and manufacturing industries in 1932. For the most part, technical developments were of intensive rather than extensive character, and the general trend in the design and improvement of equipment was toward greater flexibility and adaptability rather than toward a higher degree of automaticity or of fixed-purpose efficiency.

The year provided a thorough test of and showed the feasibility of intermittent blast furnace operation. In open-hearth practice, wider use of automatic regulation and broader application of insulation were noticeable. Progress in rolling mill development was marked by a tendency to seek flexible units affording versatile production but requiring smaller outlays for initial installations. A good example of this trend is a new seamless tube mill capable of producing hot-rolled, small-sized tubing. The equipment requires relatively small floor space and a modest capital expenditure.

Greater use of the press forging method and introduction of automatic processes marks distinctive progress in forge practice. Successful line welding of stainless steels was brought out and the first semicommercial adaptation made of flame machining using the oxyacetylene torch. In heat treatment, broader use of gas carburizing and further progress in controlling furnace atmospheres stand out as noteworthy achievements.

Foundrymen made progress in the metallurgical control of their products and in improving foundry practice while scaling down costs. For die casting, new alloys of great promise were introduced. Makers of refractories marketed several new types of refractories and insulation which show marked improvement in quality. Manufacturers of materials handling equipment solved satisfactorily an unusual number of interesting new problems, many of them outgrowths of changed methods necessitated by the depression.

Machine tool builders continued to lay more stress in design upon higher tool efficiencies, greater rigidity, and flexibility. Welded construction was employed more widely and hydraulic control continued to gain popularity.

Engineers face 1933 confident that many of the improvements now in process of development will help industry to fight its way out of the depression. Research

(*Please turn to page* 93)

PRESENTED on succeeding pages is STEEL'S sixth annual composite review of engineering progress in the steel and related industries. STEEL gratefully expresses appreciation and acknowledges indebtedness to the more than 80 of the country's leading engineers, metallurgists and operating officials, whose generously contributed opinions have made possible this compendium of technical developments in 1932.—The Editors

Fanning—A New Technique In Blast Furnace Control

CONTINUED dismantling of blast furnaces has not reduced the total available blast furnace capacity of the country but gradually has concentrated production of pig iron at better equipped and integrated plants, observes Ralph H. Sweetser, the Stevenson Co., Wellsville, O. The necessity for economy in assembling costs, especially for inland blast furnaces, and the recognition of the excess cost of high-ash coke, he points out, has resulted in the use of coking coals with lower ash, especially coals from the Pittsburgh region. It is likely that the average analysis report of Lake ores shipped this past season will show another gain in percentage of iron content, partly because of the exceedingly low tonnage (as in 1921) and partly because the trend is moving upward from the low mark of 51.15 per cent in 1928.

The foregoing two factors in blast furnace practice, higher carbon in the coke and the higher iron in the ore, will increase the potential capacity of the active blast furnaces.

THE practice of sizing blast furnace coke, Mr. Sweetser continues, is on the increase with smoother working of the furnace, less flue dust and greater actual yield. The cumulative effect is shown in the practice of sizing the coke and eliminating coke breeze, thus allowing much higher straight-line hot-blast temperatures to be carried. These higher temperatures of 1600 degrees Fahr. and over, call for better refractories in the combustion chamber of the hot-blast stoves and the use of silica brick, or other high refractories in the top courses of the checkers. The clay checkers now are denser, thus increasing the heat absorption capacity without increasing the size of the stove.

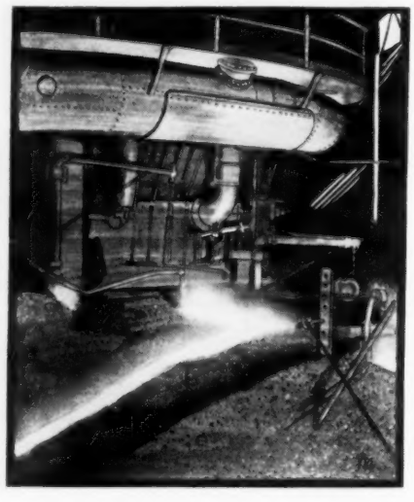
This demand for denser firebrick, Mr. Sweetser concludes, obligates the brickmaker to use machines of much higher pressure than heretofore. Much research work on the problems involved is being carried on.

Economy has been the watchword at all steel plants throughout the year just closed and has been affected largely by the stagger system of working men, intermittent blast furnace operation, shutting down of coke ovens, and reduced operations, according to Jay J. Seaver, vice president in charge of sales, H. A. Brassert & Co., Chicago.

The stagger system of working men has enabled operators to take care of a large number of employes without being partial to or slighting any particular group of workmen. This system of balancing time and work has proved satisfactory in the steel industry both from the standpoint of employe and employer.

Intermittent blast furnace operation, which could not have been tested under ordinary conditions, Mr. Seaver explains, now has been tried out by practically every blast furnace operator. This operation has been a great factor in the economical operation of large blast furnaces on small tonnages. It has permitted flexible operation of blast furnaces so that they could be stopped or started as required. Heretofore, without such flexibility the furnace either was run full blast, banked or blown out. Pioneering this kind of operation is credited to J. F. Fraser.

Shutting down coke oven batteries and cooling them off has been done as a step in the economy program. What the final results of shutting



down coke ovens and starting them up again will be, largely is a matter of conjecture. The actual economy of this practice will depend to a large extent on the length of time necessary to keep the ovens idle.

Blast volumes at stacks during 1932 gradually were reduced to keep pace with the operation of other departments, according to a report presented at a recent meeting of the iron and steel division of the American Society of Mechanical Engineers.

As a result of this procedure, flue-dust losses were reduced substantially, coke consumption was decreased, and the quality of the iron became more regular and better.

At one particular stack flue dust losses were reduced 80 per cent, and at other plants in this country less than 100 pounds of dust per ton of pig is reported. Such a small amount of flue dust can be recharged.

In the past year, the report discloses, a technique of performance has been developed which far surpasses anything previously employed. Instead of a complete shutdown of a furnace, a slight blowing or fanning is maintained. Fanning keeps the hearth hot, probably has a tendency to keep the furnace wall clean, eliminates the necessity of purging the mains, and accomplishes a considerable amount of predigestion of the stock, which greatly facilitates resumption of blowing.

Almost any combination of blowing and fanning periods can be worked out, the report states, either to meet the tonnage requirements or to accommodate periodic demands for hot metal. It would seem on the basis of theory that best results would obtain when the period of blowing is not longer than will be required to empty the furnace of stock predigested by fanning; and in practice this procedure generally is followed. From four to 12 hours blowing, alternated with periods of fanning of from four to 20 hours in duration, covers most practice.

IN DISCUSSING the amount of scrap which can be carried without interfering with the smooth working of the furnace, the report cites one case where 1130 pounds of scrap per ton was used in the burden for a period of several weeks. The feasibility of using large quantities of scrap has a great bearing on the relative cost of producing iron in the several large producing centers, and the low scrap prices that have prevailed during the past year have further accentuated the continually growing differential in material assembly costs in favor of the Detroit and Chicago districts.

Application of attention during the year just closed was active to the perfection of the electric cleaner and the year was marked by satisfactory installations of at least two electric cleaners of distinctly different design. In one type the final cleaning apparatus may be combined with the primary washer to form a single compact unit, thus conserving space and simplifying the entire cleaning system. The unit promises a saving of about 8½ cents per 100,000 feet of gas cleaned or about 10½ cents per ton of pig.

Cost of Steel Cut by Furnace Control and Insulation

WHILE it has been impossible during the past year to obtain the necessary appropriations for new installations for major building programs to utilize to the fullest extent the profitable disclosure made, there has been a quiet and earnest activity in the plants of improving many details of steelmaking practice and equipment along the lines which have been shown as valuable and worthwhile.

In some plants, comments G. A. Merkt, engineer, Morgan Construction Co., Worcester, Mass., the choice of fuel used has been coordinated to market conditions and for similar reasons radical changes have been made in some localities in the furnace charge. Successful development of suitable steel practice under these conditions is a credit to the resourcefulness of the operating personnel.

Throughout the industry furnaces have been made tighter, insulated more efficiently and operated more carefully. More attention is being paid to furnace control, be it by automatic or by hand regulation of its appurtenances. Reversing by checker or flue temperature instead of approximate time intervals has become recognized as the valuable means for large savings in multitudinous small parcels. Many furnaces are equipped with draft and pressure indicators and are therewith more exactingly watched throughout the entire system for leaks and obstructions. Oxygen meters are being used to keep the excess air in the furnace chamber to a definite minimum.

THE immediate future of the economic position of the steel industry, if not its permanent share in necessary readjustment of all industrial activity, requires renewed efforts in employing every available physical and chemical law for the most profitable exploitation of nature's resources, and in the philosophy of human co-operation. The latter will depend for its effective solution upon the ingenuity and courage of management and administration, while the former is in the hands of the artisans themselves. Their undiminished fervor will not fail the industry in this most critical epoch of its history.

Intense study and research work will produce even sounder steel and more adaptable for new products than it has already proved to be. The furnace laboratory will be given considerable attention. Fuels of all kinds will be used in a manner more thoroughly exploring their basic properties in the combustion process. The thermal efficiency of the furnace will be improved by convenient and effective utilization of the waste gases, the heat of which should be retained in the system. New and better refractories will make their appearance. The furnace structure including all its operating gear will be substantial, simple and complete as to equipment and apparatus needed for the most careful supervision of furnace performance.

Early Release Is Probable

The past holiday in our activity has turned many minds to new channels of thought and experimentation and it is to be expected that in the near future many of the hinted improvements will be released for practical adoption.

Reduction in costs of manufacturing open-hearth steel and the increase in the quality of output, which in the end also means a reduction in cost, are cited by W. J. Reagan, assistant open-hearth superintendent, Edgewater Steel Co., Oakmont, Pa., as two progressive steps accomplished by the industry in 1932.

Reduction in costs has been effected in a number of ways including the use of petroleum as a fuel. The large amount of fuel oil being used in open-hearth operation, Mr. Reagan points out, has reduced direct fuel costs and also materially reduced maintenance by reducing rebuilding costs and increasing furnace life.

Savings in fuel also have been accomplished he states, by the use of automatic furnace control and by the use of insulation. These improvements have been progressing at a slow pace, possibly because of the need of keeping costs at a minimum even though the expenditure of large sums for modernizing the open-hearth layout in the end will return substantial reductions in operating costs.

The most important metallurgical development during the past year is the completion of the investigation of the use of manganese-silicon alloys in the open-hearth process.

This work, comments Mr. Reagan, has been done under the leadership of Dr. C. H. Herty Jr., and much credit is due himself and associates. The increased use of this alloy has helped materially in increasing the quality of our steels and in reducing costs. The investigation of the use of this type alloy also has added to the knowledge of the open-hearth process in many ways.

WORK under investigation and in process of development is varied and includes all manner of insulating materials and automatic furnace equipment. The everlasting problem of iron oxide control is slowly forging ahead with increased slag studies by various steelmakers. Perhaps the most recent addition to this subject is the endeavor to correlate outgoing gas composition with slag composition and furnace practice. This promises to be a fascinating study with the possibility that such investigation will solve the iron oxide control problem. This work is being done by the use of an automatic oxygen recorder giving a continuous record of the composition of the outgoing gases and correlating the results with the slag composition at the same time gas samples are taken.

The mystery of the open-hearth process continues to be solved and it is only a matter of time until much of the present guesswork will be removed from the problem. The year 1932 has been one of progress even though the tonnage figures are not commendable.

Reports on insulated open-hearth regenerators, slag pockets, flues and sections below the floor, have proved the advisability of insulating all such appurtenances, observes

(*Please turn to Page* 89)

Small Hot-Finished Seamless Tubing Made in New Mill

DESPITE drastic curtailment in rolling mill operating schedules the past year, several contributions to the advancement of the industry were made. In the front ranks of rolling mill progress is a new type seamless tube mill. Heretofore, the great problem has been to convert a hollow or pierced billet into a high-grade tube with a wall thickness thin enough to serve ordinary commercial requirements. Cold drawing usually has been necessary to meet specifications in the smaller sizes.

But with the mill which swung into commercial operation last year, the diameter and wall thickness of seamless tubes are reduced simultaneously in a stand of rolls called an elongator. With a heating furnace, a piercing mill handling 3-inch billets, and an elongator, it now is possible to hot roll seamless tubes ⅞-inch diameter. With a sinking mill serving such an installation, production schedules can be made to include hot rolled seamless down to ⅜-inch diameter and 16 gage. Thus, for the first time seamless tube manufacturers are able to compete with electric welded and buttwelded pipe in the commercial market.

ROLLING mill advancement during the year just closed, comments R. J. Wean, president, the Wean Engineering Co. Inc., Warren, O., included the wide adaptation of continuous furnaces and mechanical feeding and catching tables to the conventional sheet and tin mills. He reports about 200 continuous pack and pair heating furnaces of various makes and about 30 mills equipped with automatic feeding and catching tables. All grades of products including tin plate and common black, electrical and full-finished sheets are being made with this equipment.

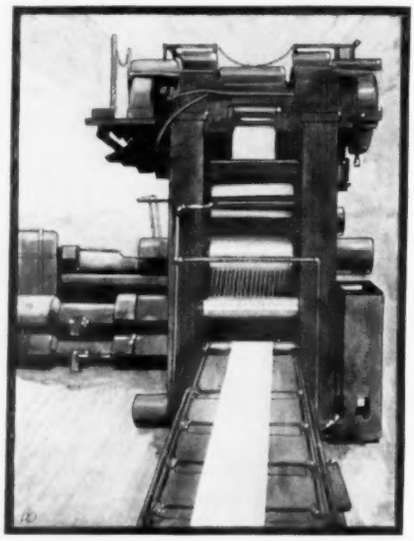
The past year, he continues, has seen the general adoption of wide sheet bar and hot strip sheared for breakdown purposes. This eliminates roughing operations in the hot sheet mill and makes possible the application of mechanical handling devices through the entire hot rolling operation. Speaking of sheet and tin mill heating problems, Mr. Wean points out that the greatest contribution during the year probably was the successful application and use of heavy oils for fuel purposes. These heavy oils, he explains, have been applied to heating tin plate, sheets of all grades, and normalizing of sheets, at fuel costs that approximate the old coal-fired furnaces and at costs of about one-third to one-half the prevailing natural gas rates in the Middlewest districts.

In the past year, observes S. M. Jenkins, assistant sales manager in charge of high-temperature insulation, Armstrong Cork & Insulation Co., Lancaster, Pa., considerable time has been spent in developing the ideal furnace for bright annealing of sheets, strip, plates, and tubes. This type furnace subjects refractory linings to the action of reducing atmospheres and since the unit is operated under pressure the walls must be gas tight. The presence of moisture sometimes is detrimental: air seals are of increased importance.

Quick Change Essential

Further developments of the chain production method of handling sheets, packs, pairs, bars, etc., of which the furnace is a vital part, were effected in 1932. In most cases, Mr. Jenkins contends, the furnace used for this operation should be such that the temperature can be changed quickly which is accomplished by having low heat storage in the walls and arches.

The sheet and tin plate industry seems to have gone through the throes of a violent awakening, as is evidenced by the installation of automatic equipment, comments H. A. Winne, industrial engineering department, General Electric Co., Schenectady, N. Y. On account of the extremely rapid operating cycles on the automatic catcher equipment, requiring the driving motors to reverse up to a maximum of 40 times per minute, it has been necessary to develop special motor and control equipments.



An important development in the sheetmaking industry has been the application of the photoelectric tube as a limit switch to control the automatic operation of the catcher equipment.

For use in connection with sheet mill automatic catchers, Mr. Winne continues, a device has been developed and built which permits the roller to obtain automatically a fairly exact indication of the length of the sheet after each pass. A small selsyn generator is geared to the mills so that its speed is proportional to the speed of the sheet going through the mill. A receiver is connected through a small magnetic clutch to a pointer which indicates the length of the pack. The clutch is controlled by a photoelectric cell or a flag switch actuated by the sheet as it comes through the rolls. When the front end of the sheet passes the photoelectric tube the clutch is energized, connecting the pointer to the receiver, which rotates continuously at a speed corresponding to the sheet speed.

Consequently, the pointer begins to rotate and continues until the rear-end of the sheet passes through the field of vision of the phototube, which causes the clutch to disconnect the pointer from the receiver. Obviously, the position of the pointer at this instant is an indication of the total length of the sheet. The device can be arranged either so that the pointer immediately resets, or it can be held in the final position for a second or two, and then automatically reset. This device saves a considerable amount of the roller's time by eliminating the necessity for actually stopping the sheet and measuring its length.

IMPORTANT developments in mechanization and automatic control of heating furnaces, conveyors and mill tables for sheet and tin mills also are recognized by A. F. Kenyon, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The quality of the product is better and more uniform, he points out, because of the accurately controlled and uniform heating and rolling of each piece and the speed of handling and mill production rate are increased by 50 per cent or more, due to the elimination of the previous hand manipulation by men with tongs.

A line of circuit breakers introduced last year is well suited for steel mill main roll drive control, particularly where the motor frequently is inched to line up the

couplings or extract mill cobbles. The breakers employ a new principle of arc extinction in which no oil is used, and are suitable for the control of electric power circuits up to 25,000 volts. A powerful magnet blowout incorporated in the circuit breaker almost instantly transfers the arc from the contacts to a special de-ionizing chamber where it is moved at high speed over metal plates, cooled and extinguished.

Automatic Forging Methods Perfected; Heat Control Applied to Furnaces

LOW operating rate on the part of most forge plants has made it a difficult problem to ascertain just what real constructive progress has been made in the forgings industry. A noteworthy development in the drop forging field was the appearance in October of the long-awaited survey of production and capacity made by the department of commerce in co-operation with the American Drop Forging institute.

This survey revealed (STEEL, Oct. 10, p. 28) that if the 1931 single-shift capacity of 182 representative drop forging plants were to be completely utilized at the present time, production would have to be at a rate of about 70 per cent over the supposedly peak level of 1929.

EXAMINING the technical side of the industry, press forging seems to have received more attention during the past year than any other branch, according to L. E. Ruby, works manager of the Pittsburgh Forgings Co., Jackson, Mich. Powerful presses, apparently unlimited in size, have made possible automatic forging of numerous parts, as well as the production of forgings with minimum machining allowances, Mr. Ruby observes. The Ford Motor Co. is making use of this type of forging to good advantage in the production of front axles (STEEL, July 18, p. 2[illegible]

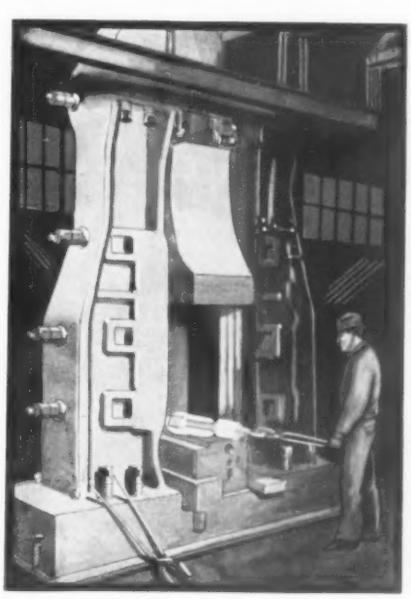
Mr. Ruby points out that grain structure and metal flow in drop forgings have received more attention the past year than usual. Metal flow is an important factor in production of strong forgings of minimum weight. Upset forgings, produced either by forging machine press or hammer upset, are constantly meeting with greater demand. Mr. Ruby adds that the keen competition experienced in the industry last year has pointed the way to lower costs, not however through greater efficiencies in equipment and production but in general efficiency of plant operation.

Development of a high-speed continuous furnace for miscellaneous automotive forgings, the stock in the form of round, square or hexagonal bars being automatically charged into the furnace and the hot bars automatically discharged directly into a high-speed forging press, is cited by A. D. Dauch, George J. Hagan Co., Pittsburgh, as an interesting innovation introduced in 1932. Another unusual development of 1932 was the Ford Motor Co.'s installation of equipment (STEEL, Aug. 1, p. 23) for automatic heating and forging of gear blanks on rear axle shafts.

Aim at Better Heat Control

Automatic temperature control has been installed in a number of both modern and old types of forge furnaces, chiefly at the instigation of metallurgists who have found that desired physical properties in certain forgings cannot be obtained without control of heating at the source of the forging operation.

Other furnace developments include the more widespread adoption of diffusion combustion, by which the work is blanketed with raw gas, minimizing oxidation or scaling, even at a temperature of 2400 degrees Fahr. Surface Combustion Corp., Toledo, O., has pioneered in this work and has designed both continuous and in-and-out slot-type forge furnaces with diffusion combustion burners.



A leading manufacturer of board drop hammers in 1932 introduced a newly designed hammer with variable stroke. In this design, the operator has available either a light or heavy blow, a short or a long stroke, and can choose either at will (STEEL, Aug. 15, p. 39).

RESEARCH has proceeded into improved die steels. For some work nitrided steel has shown remarkable service. In quantity production of forgings, increasing importance is being attached to the process of die typing, by which light hammer and press forging dies to be used in production are formed while hot from a master type on which the impression of the shape to be forged is tooled in relief. Expense of die sinking a large number of dies is thereby eliminated and it has been shown that the typed dies will produce about 25 per cent more forgings than cut dies. Ford Motor Co. is using die typing extensively (STEEL, Aug. 15, p. 21) and is effecting some remarkable savings.

Cost of Steel Is Cut by Furnace Control

(*Concluded from Page 87*)

S. M. Jenkins, assistant sales manager in charge of high temperature insulation, Armstrong Cork & Insulation Co., Lancaster, Pa. However, much time is being spent upon the possibility of using high temperature insulation above the floor, especially on open-hearth melting alloys at high temperatures which offer an excellent steel for superrefractories which in turn allow for high temperature insulation.

A large steelmaker has been experimenting for a number of months with a method of firing open-hearth furnaces through the roof, the flame being directed generally downward and toward the back wall, according to a recent report of the iron and steel division, American Society of Mechanical Engineers. This experiment is being conducted with considerable secrecy, but it is understood that the time of heat is shortened materially with some fuel, and with considerable savings.

Another method involving the firing of the furnace from four points is being introduced, the report states, but it probably will be some time before definite results will be available for comment. The successful conclusion of either of these methods would mark the first radical change of open-hearth practice since the days of Siemens and Martin.

Welding Processes Benefit From Research Studies

PRODUCTION of higher quality welds through use of more heavily coated electrodes and improved processes, flame machining with oxyacetylene torch, successful continuous spot welding of stainless steels, and perfection of more powerful X-ray inspection apparatus appear to be prominent developments in welding during 1932. Relatively little technical progress was accomplished for fabrication by riveting, a prosaic process still serving a broad and useful purpose.

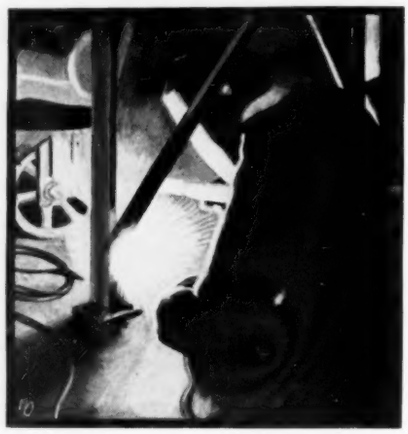
From the long range viewpoint, W. Spraragen, secretary, American Bureau of Welding, New York, considers continued acceptance of welded products as of far-reaching importance. Fortunately for the industry, those responsible for general promotion and development are sold on scientific research. Co-operative and private research have kept pace with growing demands and needs. Although some 30 universities are working in various phases of fundamental problems the Bureau recently compiled a list of some 60 problems needing further solution.

H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y., calls attention to a list of 40 research undertakings in which the American Bureau of Welding and the National Research council are interested. These projects constitute the laboratory research activities of the bureau's fundamental research committee; however, arrangements now are being made for library research on certain important subjects. It is believed that a given outlay on library research may advance knowledge at least as much as an equal outlay on laboratory research.

A RESEARCH problem not yet investigated, according to T. R. Lawson, head, department of civil engineering, Rensselaer Polytechnic institute, Troy, N. Y., is that of internal stresses produced in welding. This subject has not received merited attention for undoubtedly the strains are large and no method for reducing them has been discovered. Work along this line may be undertaken this year.

Major developments in oxyacetylene welding and cutting, according to the Linde Air Products Co., New York, include a new high-strength bronze welding rod; flame machining; the deseaming blowpipe; a new technique for cutting chrome-nickel steel risers; and improvements in its semiautomatic welding process. The new rod extends bronze welding for repair of broken castings and building up worn surfaces.

Flame machining is allied closely to flame cutting, its main distinction being a tangential positioning of the cutting oxygen stream. Though as yet only partially commercialized, the processes accomplishes planing, milling, turning, drilling and boring. The deseaming blowpipe is being used increasingly in both steel foundry and mill for such operations as removing cracks and seams, for hogging and surface planing. Employing the new special technique for removing risers from 18-8 chrome-nickel steel castings, it is said a skilled operator can sever a riser in



scarcely more time than that required for an ordinary steel riser.

A vast increase in knowledge as to why welds fail in service was an important development in electric arc welding during the year, states Robert E. Kinkead, consulting engineer, Cleveland. This knowledge was obtained from photoelastic methods of stress analysis largely from work of Everett Chapman, director of research and development, Lukenweld Inc. Quantitative analysis of stress concentrations due to failure of fusion, gas pockets, slag inclusions, contour of weld, and discontinuities in general has made it possible to predict weld behavior more accurately.

Discontinuities Still Problem

Making welds which are entirely free from certain discontinuities still is an unsolved problem, says Mr. Kinkead. Substantial progress has been made in improvement of welding rod coverings, but we have about reached the end of the road in this direction. A new angle of approach is needed to bring arc welding to its final stage of perfection.

In the field of arc welding apparatus, new equipment commanding attention is the wire feeding carbon arc process which has independent control of welding heat and metal deposition; a new wire feeding head for making Class 1 welds continuously; and a new process based on the self-consuming rod principle, concludes Mr. Kinkead.

Commercial application of the shielded arc on a large scale was an important development in 1932, declares J. F. Lincoln, president, Lincoln Electric Co., Cleveland, this covering not only the application of a welding electrode with a shielded arc coating, but also welding automatically by a process which produces the shielded arc. Although electrodes used in the process cost more because of the special nature of their coverings, welding is performed at greatly increased speeds, therefore, total cost is less than with bare or washed electrode welding. Deposited metal now is from 30 to 50 per cent stronger than the plate metal, with ductility fully as high as the parent metal and a specific gravity somewhat higher.

A DEVELOPMENT which undoubtedly will be of much importance in future work in resistance welding is that of accurate timing control so that power of one-half cycle or multiples thereof can be delivered, comments A. M. Candy, engineer, small motor appliance and welding engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This, he says, is of paramount importance in welding critical alloy steel such as 18-8 stainless.

Alternating-current arc welding apparatus has been further improved and is much more satisfactory from the welder's standpoint. Welders have been able to improve their technique and to produce better welds through use of electrodes treated with newer coating materials. In speaking of the field of application for welding, Mr. Candy points out that development of the frameless-type welded steel house has tremendous possibilities.

An important engineering event of 1932, in the opinion of James W. Owens, consulting welding engineer, Portsmouth, Va., was the award of the contract for welding the steel outlet pipes of the Hoover dam. Some of these pipes are 30 feet in diameter and 2⅞ inches thick. Speaking of welding in general, Mr. Owens believes there is room for improvement in design, fabrication, assembly, welding and testing technique, but such improvement will consist principally in an application of our present knowledge rather than new and revolutionary developments.

Frank P. McKibben, consulting

engineer, Black Gap, Pa., and president of the American Welding society, lists developments of 1932 as: Extended use of X-rays in examining seams in welded tanks and boilers; increased interest in and wider use of coated welding wires; demand for specifications to facilitate repair by welding of existing wrought iron or steel bridges; and finally, a great increase in application of welding to strengthening and rehabilitating metal highway and railroad bridges.

Equipment for resistance welding and flash stripping steel barrels was developed in 1930 and since then practically every large barrel maker has installed machinery for the process, reports M. L. Eckman, Federal Machine & Welder Co., Warren, O. During the past year similar equipment has been perfected for making steel pails and kegs and range boilers. Resistance welding machines also have been developed to produce tapered tubular steel concrete piling at high speed.

Fabricated steel flooring light in weight yet very strong is another development for resistance welding. Recently, Mr. Eckman's company built a machine 60 feet long and weighing 45 tons which will produce this flooring continuously. The demand for extra wide sheets for automobile body work has necessitated development of large mobile resistance welders for continuous mills. One such unit weighs 60 tons, runs on a standard-gage truck and handles 3/16-inch sheets up to 72 inches wide.

BEING interested almost exclusively in the welding of stainless alloys, L. W. Hostettler, engineer, Allegheny Steel Co., Brackenridge, Pa., finds that fabricating plants without exception have made decided improvements in welding technique, particularly in metallic arc welding of lighter gages. The outstanding development, however, is the advance in the resistance type of welding, known as line or continuous spot welding. The chrome-nickel corrosion-resisting alloys have extremely high electrical resistivity, therefore are welded readily by this method. Advantages of the process are greater speed, lower cost and retention of physical characteristics of the welded area due to the fact that the welding is done under water.

J. B. Johnson, chief, material branch, war department, air corps, Wright Field, Dayton, O., agrees that there has been an improvement in technique in spot welding stainless steels, also aluminum alloys. However, neither of these problems are completely solved as yet, he says. Somewhat minor application of welding is the hard surfacing of parts in internal combustion engines, such as valve seats and valves. By this procedure it is possible to obtain a combination of properties which give a better performance than could any one material.

J. W. Meadowcroft, Edward G. Budd Mfg. Co., Philadelphia, points to his company's development of the shot welding process for welding stainless steel as one of the great engineering developments of 1932. This process was employed in fabricating the new-type light-weight rubber-tired railway car placed in service last fall. Two great problems still are to be solved, says Mr. Meadowcroft; one is the machining of steel with the same accuracy as a machine tool by a gas cutting process and the other is resistance welding of ships and buildings.

Flash Welding for Aircraft?

Viewing welding from the aircraft viewpoint, Charles Froesch, General Aviation Mfg. Corp., Dun-

dalk, Md., states that successful electric spot welding of stainless steel and aluminum and its alloys have been outstanding developments of the year. Spot welded stainless steel now is acceptable in aircraft welding, but further work is required before aluminum and nonferrous welds can be considered reliable. Mr. Froesch believes there is a possibility that flash welding as now used in automobile body manufacture may be adopted to aircraft production as soon as quantities permit.

Great advances have been made in the application of welding to naval construction during the past year, asserts Leon C. Bibber, senior welding engineer, bureau of construction and repair, navy department, Washington. In late naval designs, practically the entire transverse structure is welded. Longitudinal seams of important strength members have not been welded, but experiments conducted recently by the bureau show this to be entirely feasible and it may come to pass soon now.

Developments in thermit welding have been primarily improvements in the rail weld, tending to simplify the welds and to enable them to be made without interrupting traffic as formerly. According to J. H. Deppeler, chief engineer and works manager, Metal & Thermit Corp., New York, these welds now are made under traffic with numerous interruptions, simplification of the apparatus making this possible. Mr. Deppeler also comments on the superior welds which are produced by the arc method using the improved heavy-coated electrodes.

Progress in nondestructive testing of welds continued last year with advent of an X-ray tube for continuous operation at 300,000 volts, declares Ancel St. John, St. John X-Ray Service Corp., New York. This extended to 4 inches the thickness of steel which can be inspected in a reasonable time. Equipment for producing this high voltage was so bulkly and cumbersome that in cooperation with patent owners, the St. John corporation developed a compact unit considerably less than half the original dimensions and weighing under 6000 pounds. It can be operated in any position.

Because of assurance which they afford, Class 1 construction and X-ray inspection are used frequently where not required by the boiler code. This is increasingly true for thin plate, says Mr. St. John. Flexibility in X-ray inspection has been increased by development of satisfactory high-tension cables. In Germany, he relates, welded boiler drums in position in a ship are examined by placing the X-ray tube within the drum and connecting it to a power plant by some 250 feet of high voltage cable.

DEVELOPMENT of radiographic testing of welds to a state where users of pressure vessels and insurance companies have adequate confidence in the vessels, perhaps is the greatest step in welding during the year, comments Gilbert E. Doan, associate professor of metallurgical engineering, Lehigh university, Bethlehem, Pa. A great variety of welded work now is required to stand test by X-rays or gamma rays before use. Contrary to stifling welding as was expected, these requirements have had the opposite effect. Gamma rays are being used to supplement X-rays in penetrating thicker sections and also in providing a source of rays without power equipment. The test can be conducted anywhere.

Referring to the use of welding in building construction, Lee H. Mil-

(*Please turn to Page* 100)

Gas Carburizing Process Is Widely Adopted in 1932

IN THE field of heat treatment, wider application of continuous gas carburizing appears to be the most significant development of the year. Closely following it are further advances in nitriding, in controlled atmospheres in furnaces, in furnace design and in metallurgical research. The march of progress has continued in spite of discouragingly low production operation.

The trend of furnace design, says J. M. Watson, metallurgical engineer, Hupp Motor Car Corp., Detroit, is to develop continuous furnaces in which the atmosphere can be controlled closely. This probably is done best by heating and introducing gases into heating chambers so that oxidation can be controlled. The most outstanding development is the gas carburizer in which it is possible to maintain different carburizing mixtures in different chambers of the furnace. Mr. Watson doubts that temperature control is subject to much more refinement, as with present equipment it is possible to maintain a temperature of plus or minus 5 degrees up to a maximum of 1700 degrees Fahr.

NITRIDING seems to have lagged considerably, but still has great possibilities, especially in production work, in the opinion of Mr. Watson. Likely it will return to popularity when plant operations return to more steady schedule.

Present tendency is to the return of carburized gears in transmissions of automobiles, he states. Because of increased power and pulling capacity of engines and the desire to keep transmission units small, it has become necessary to use steels which are susceptible to extremely high stresses without failure. The most noteworthy steel of this type is the nickel-molybdenum.

E. F. Davis, metallurgist, Warner Gear Co., Muncie, Ind., also is impressed with the headway made in continuous carburizing with gas and the gaining favor of molybdenum steels in both the nickel and chrome and nickel combinations. The fine-grained carburizing steels are being used to a great extent in rear axle gears, being hardened by a direct quench after carburizing with no subsequent heat treatment except a tempering operation varying from 275 to 700 degrees Fahr. Superior wearing properties without brittleness and relief from distortion are advantages claimed.

This observer sees more carburizing performed by the aerocase process instead of cyaniding. Higher percentages of carbides and lower nitrides in the case area are the chief differences, also greater case depth in shorter time. One problem in connection with the aerocase method, however, is the difficulty in washing off the lime formation from the calcium chloride used in the heating bath.

Need To Define Abnormality

Proper definition of abnormality of steel is needed, according to Mr. Davis, for steels termed abnormal have definite benefits in certain heat treating processes. It is recognized that a degree of abnormality may be highly beneficial to the ultimate

strength and resilience of the product. Some metallurgists believe that the term is a misnomer as it intimates an inferiority in quality and defective steelmaking practice, whereas this is not necessarily true.

Developments of the year are classified by F. T. Sisco, editor, *Alloys of Iron Research*, New York, as advances in knowledge of the principals underlying the changes in heat treatment; advances in commercial heat treating; and advances in nitriding. In the first class are the two notable lectures by E. C. Bain on the rates of metallurgical reactions in solid steel and factors influencing the inherent hardenability of steel; continued interest both here and abroad in precipitation hardening; and further attention on the question as to whether steel can be superhardened magnetically.

Dr. Bain's lectures have cleared up some of our problems connected with the heat treatment of plain carbon and alloy steels; what the practical consequences will be it is too early to determine, probably they will be far reaching. It is interesting to note that Bain's results confirm the conclusions reached by Dehlinger in Germany, who, attacking the problem theoretically, arrived at the major conclusion that grain size is one of the most important factors in the heat treatment of steel.

In the second class, says Mr. Sisco, is the commercial application of continuous gas carburizing with hydrocarbon gas, a process now used successfully by some automotive manufacturers. Because of its efficiency, uniformity, speed, cleanliness and simplicity, further large-scale installations may be expected. An important recent development in efficient equipment is the bell-type furnace which may be used for gas carburizing, nitriding, or bright annealing, using hydrogen or inert gas. It is claimed that nitriding costs are cut nearly in half by use of this furnace. Importance of controlled atmosphere is emphasized by work of Sam Tour, showing that the structure of high-speed steel is affected by the oxygen and carbon monoxide in furnace gases. In effect, the atmosphere shifts the phase diagram of the 18-4-1 grade, and consequently makes necessary a careful consideration of furnace gases versus hardening temperature.

Referring to the third class, Mr. Sisco says recent developments in nitriding have resulted in further reduction in cost. Noteworthy are two recent investigations on materials, one on a chromium-vanadium nitriding steel, and the other on the effect of nickel in nitriding steel.

In the opinion of H. M. Boylston, professor of metallurgy, Case School of Applied Science, Cleveland, an important development has been the increased tendency toward the use of continuous heating furnaces for heat treating. Considerable research has been done on the control of atmosphere in furnaces, a problem which is especially important in connection with continuous normalizing of sheets and wire. How to normalize these products continuously without abnormal scale losses is a problem for the future. Scaling is a problem encountered in nearly all types of heat treating, but for tool hardening it has been solved with controlled atmosphere furnaces.

IN ADDITION to the recent important development of continuous gas carburizing, R. G. Guthrie, metallurgist, Peoples Gas Light & Coke Co., Chicago, comments on the use of automatic CO_2 records on heat treating furnaces. Considerable research has been conducted on the

equilibria of gases in contact with ferrous metals and some with nonferrous metals. Results are being applied in a practical way by changes and improvements in apparatus.

Carburizing appears distinctly on the increase as to application and nitriding somewhat on the decrease in Mr. Guthrie's opinion. Nitriding is most useful and has a definite place, but carburizing has certain advantages which contribute to its wider acceptance.

Infallible System Needed

Temperature control is susceptible to more refinement, he continues, but there is no object in controlling beyond a practical range. Modern equipment has closer control than the operator can handle or manipulate for steel. An infallible system of heat treatment is the greatest need at present. We are already saturated with different types of steels and the problem is to get the most use of the best of them.

Gas carburizing stands out strikingly this year, in the estimation of W. B. Coleman, president, W. B. Coleman & Co., Philadelphia, and 1933 president of the American Society for Steel Treating. Butane has made considerable strides in the past year, not only as substitute for city gas but as an ingredient in gas mixtures. Some excellent results in wear have been obtained by carburizing in a certain mixture of butane and following with special methods of heat treatment. There is a tendency to extend the use of liquid baths for continuous heating of material to be followed immediately by quenching. Also noticeable last year was an effort to obtain the temperature of pieces to be heated rather than the furnace temperature adjacent to the pieces. Abroad, there has been some use of oxyacetylene flame heating of surfaces to be hardened by immediate immersion by means of rotation.

Mr. Coleman also considers the nitriding of cast iron as an outstanding development. By the use of alloys, cast iron is being improved in quality and its use is being investigated in many fields. Nitrided to produce a hard surface, this iron offers an unusual opportunity for users of the material to reduce costs. In the nitriding of steel, research into newer alloyed materials as substitutes for present steels is encouraging.

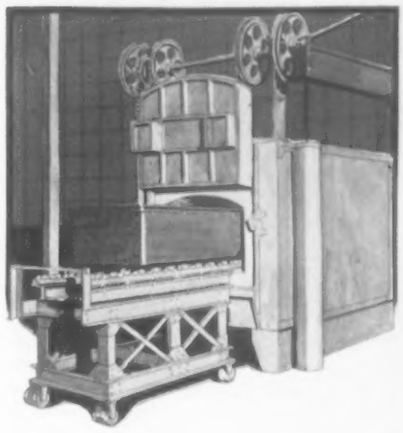
Centrifugal casting of a nitridable cast iron and evolution of nitriding steels exhibiting the phenomenon of dispersion hardening, are developments pointed out by V. O. Homerberg, technical director, Nitralloy Corp., New York. Cylinder liners of the nitricastiron are being cast on a production basis in France and England and within recent months in this country. These liners are giving excellent service results. Sand casting of this material offers many difficulties, but investigation indicates early solution of the problem.

In a study of nickel in nitriding steels, Dr. Homerberg and H. J. French discovered that this element develops dispersion hardening in steels containing appreciable proportions of aluminum by means of which articles may automatically acquire higher core strength and elastic properties during nitriding. Nickel also strengthens and toughens the case with moderate decrease in case hardness; furthermore, it strengthens and hardens the core and thereby provides a better support to the case.

NITRIDING, being comparatively new, has been hindered by the depression, but H. H. Ashdown, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., predicts a wider application may be expected upon business recovery. In the meantime, research has been extended. The Westinghouse company has developed a method for spot and local softening of the nitrided case without in any way impairing the surrounding case. Previously, to perform any machining operation on the nitrided case, it has been necessary to denitride or soften the entire unit, which has been exceedingly costly and entailed delay. Now any necessary alteration can be effected in a few minutes.

Mr. Ashdown reports that for certain applications, nitrided drills, broaches, reamers, cutters, and the like, of high-speed steel, will give ten times the life of normally treated tools. Advantage is taken of the growth during nitriding, so that worn down tools may be renitrided and reground lightly to restore them to their original size. Many tools so treated have given as much as 40 times normal life. Still further life of these tools is promised by chromium plating.

Nitrogen surface hardening is as applicable to both steel and cast iron of suitable composition, he adds. In many fields, advantage is taken of the resistance to wear, corrosion and erosion of these materials. Particularly do they show enhanced properties at elevated temperatures.



R. L. Dowdell, professor of metallography, University of Minnesota, Minneapolis, lists improvements in nitriding, gas carburizing, gaseous atmosphere during heating cycles for hardening and annealing, highly improved burners for fuel-fired furnaces, and better control equipment as most welcome in the present science of metallurgy.

In spite of technical advances, however, Dr. Dowdell points out it is astonishing to note the lack of modern equipment in many plants. Some of these plants still do important heat treating by eye at the customary "Light cherry red" which frequently is hot enough to burn steel. Breakage and warpage of expensive tools and dies is the result.

In the field of temperature control equipment should be mentioned the application of the photoelectric tube or electric eye to heating operations. The eye is trained upon the steel during heating and when the steel attains the proper temperature as determined by the color, it is discharged from the heating machine or furnace by functioning of the photoelectric relay. Close uniformity of temperature is claimed for the equipment.

Engineering Is Valuable Aid in Depression

(Concluded from Page 85)

activities have been maintained at a gratifying rate throughout this acute period, and this fact in itself is conclusive evidence that today management is more thoroughly cognizant than ever before of the important role of engineering in industrial progress.

New Machine Tools Feature Increased Productivity

UNDAUNTED by another depression year bereft of sales in encouraging volume, machine tool and plant equipment industries have prepared for better times through a continuation of technical activity. Machine design was studied perhaps more vigorously in 1932 than in any year in history. With industry operating at rates far below normal but determinedly seeking profits despite reduced production, purchases of equipment were limited largely to units which could show positive economy.

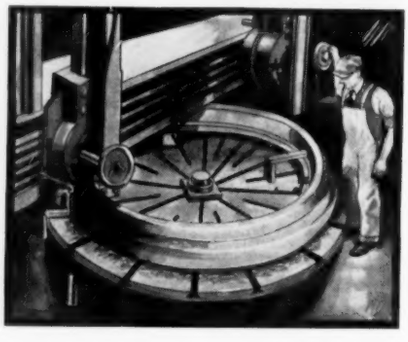
Out of this depression era have come tools and equipment advanced in design far beyond the point of the boom year in 1929. In a general way, little change in trends is to be noted, although progress has been more rapid in some directions than others. Briefly stated, important developments of the past year have been along the line of increased efficiency, higher production rates, automaticity, hydraulic control, centralization of controls, improved bearings incorporating preloading, built-in motors, greater rigidity, higher speeds and welded construction.

REDUCTION of idle machine time, arch enemy of production and profit, particularly in times like these, ever has been a major objective to the engineer. Posted in a large industrial plant is an imposing placard bearing the inscription, "Has it ever occurred to you that 77 per cent of our machine time is idle?"

The theme of this startling poster long has vexed engineers, but it remained for Max L. Jeffrey, National Acme Co., Cleveland, to find a solution. Late last year he obtained final patents on the "chronolog," an instrument providing the operator throughout the day with a visible record of idle time in minutes, production time, and a count of units turned out. Besides these, a printed record is produced in detail, revealing precisely when the interruption occurred, why it occurred, and how long it delayed normal production.

Comments of Tell Berna, sales manager, National Acme Co., are particularly pertinent. Of the chronolog, he states that the unit is adapted not only for machine tools but for punch presses, rolling and blooming mills and assembly operations of all kinds. It is not merely in the development of better machines that we must be of service to customers but in enabling them to maintain a high rate of production after the equipment is purchased and to avoid excessive production expense due to lost time. Mr. Berna sees an increase in fast machines to make the fullest possible use of modern cutting metals, and a trend toward simple universal machines that can be changed quickly from one job to another, rather than special purpose and expensive units for which volumes now on order are not sufficient.

Under present business conditions, it seems to J. R. Weaver, works equipment engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., that industry will not need additional equipment for some time to come. Cost reduction equipment, he says, is not advocated as strenuously as it might be due to the criticism



that may be brought about by increasing unemployment. It appears that considerable effort must be put forth or it will be several years before there will be a normal demand for machine tools.

Because recovery will be slow, he declares that it is absolutely necessary for industry to put its house in order and make a profit at a lower percentage of activity. Where it was imperative in previous years to attain a 50 per cent activity to start to show a profit, it will be necessary to make this profit at a much lower percentage of activity. Those industries which realize this fact and establish their designs accordingly, asserts Mr. Weaver, will undoubtedly recover much more rapidly than those who do not appreciate it.

To aid the situation, he continues, the machine tool industry should bring to the attention of all users of equipment their latest designs. Manufacturing methods, however, must be analyzed to ascertain that the best method is being adopted in producing a commodity. A machine tool builder can contribute materially in this respect by showing the various methods which can be employed in tooling up.

In the opinion of George H. Johnson, vice president, Gisholt Machine Co., Madison, Wis., the outstanding development in design and application of production machine tools during the year just closed has been the introduction of special machines. The greater part of machine tool activity in the past year would seem to have been the result of close attention on the part of builders in offering a sound economical proposition on certain high production operations. There have been, he says, a number of cases where the purchase of special machines has been justified on the basis of savings made over a short period of time.

Summing up some of the important factors in machine development over the past year, George T. Trundle Jr., president, Trundle Engineering Co., Cleveland, points to the careful consideration now being given to the application of springs, rubber and cork to eliminate noise and vibration. This leads to increased attention to static and dynamic balancing. With the more rigid laws pertaining to the workman's compensation act and with higher machinery speeds, safety engineering has gained increased foothold in connection with machine design.

Redesign and improvement, Mr. Trundle sees as a prime necessity to meet the requirements of potential markets. As steps in this direction he observes that more attention is being given to appearance of machines from a selling standpoint, enhancing "eye appeal" which tends toward standards for colors and finishes.

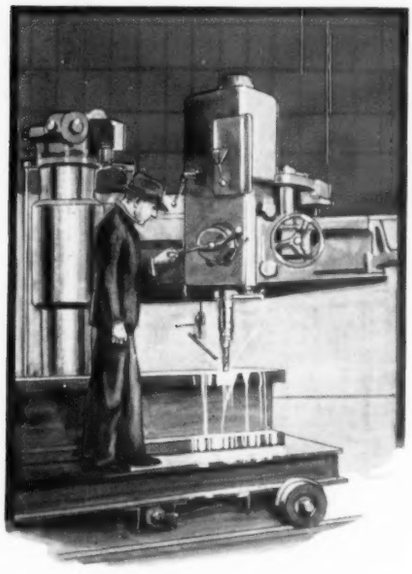
ADVANCEMENT in design to attain increased accuracy in machine tools includes noteworthy progress in bearing practice. For main spindle mountings, according to John H. Baninger, assistant chief engineer, New Departure Mfg. Co., Bristol, Conn., ball bearings are installed under a determined preload, preferably with manual adjustment provision, to avoid chatter and to hold the machining accurate and uniform. Adjustment of imposing the preload upon the bearing is done after the bearings are installed in their housing to facilitate the assembling of the spindle with the bearing, due to bearing outer rings expanding and absorbing the allowed clearance.

Particularly interesting and typical of studied investigation are the

activities of the General Electric Co., Schenectady, N. Y., outlined by B. G. Tang, general superintendent. This company, recognizing the fact that certain limitations in the present design of machine tools must be bettered in order to obtain the full benefit from carbide cutting materials, some time ago inaugurated a campaign among machine tool builders to suggest certain modifications in their products.

THE engine lathe was first of a series of machine tools to be investigated. As explained by Mr. Tang, manufacturers were approached with definite suggestions covering changes including torsionless bed, ultra-rigid support for all cutting tools, minimum or elimination of overhang of cutting tools, rigid live tailstock, headstock integral with bed, main spindle of largest diameter possible with speeds contemplated, antifriction bearings throughout, main spindle coupled direct through flexible coupling to main driving motor for high speeds, automatic chip disposal, and complete unit control from carriage with all functions interlocked.

Three lathes eventually were purchased, each from a different manufacturer; one lathe being equipped with mechanical feed, one with electrical and the third with hydraulic feed. These units all have been received but present subnormal business conditions have interfered with the extensive trials contemplated. What little has been done with them,



however, comes up to expectations, Mr. Tang advises.

An expression from the aircraft industry is provided by W. W. Finlay, production engineer, Wright Aeronautical Corp., Paterson, N. J. He states that there is no mass production problem in building aircraft engines and therefore opinions relative to trends and equipment designed, naturally will be colored by that condition. However, cheaper production is growing increasingly important to this industry, and the tool development likely to affect it is of interest.

Introduction of nitralloy in the design of high-speed gear members and parts operating under conditions of heat, Mr. Finlay holds as responsible for considerable change in manufacturing methods. In order to obtain the utmost of concentricity on high-speed gear members for instance, much refinement has been necessary in grinding and lapping the gear after quenching. It is in the equipment for this lapping operation that much improvement will be revealed in the immediate future. He attaches considerable significance to the development of an external cylindrical lapping machine designed on the same principle as the centerless grinder. Should this prove to be as successful as it first appears its effect will be far reaching.

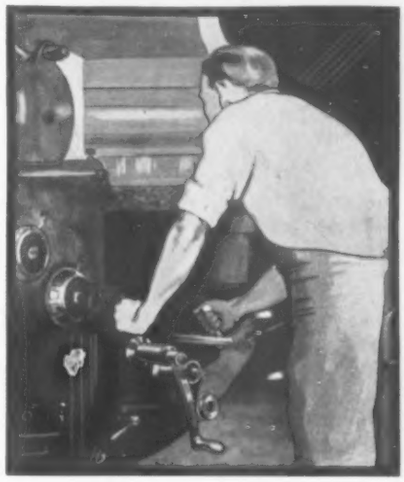
Study Cutting Oils

Considerable research has centered around cutting oils and coolants, particularly regarding the sulphur content of cutting oils. Arising out of the work conducted by the Wright company in this connection, Mr. Finlay tends to the opinion that the reason for greater cooling efficiency in the sulphurized cutting oil is because of its increased film strength, making possible the use of a low viscosity oil and consequently maintaining the cooling medium closer to the cutting points.

A pronounced trend toward the use of more general purpose machinery rather than special purpose units is seen by Carle M. Bigelow, president, Bigelow, Kent, Willard & Co. Inc., consulting engineers and merchandising counselors, Boston. The thought seems to be that because products are changing so rapidly it is inadvisable to invest too much capital in special process equipment which may become obsolete at anytime. Mr. Bigelow is inclined to believe that this will be the general policy for some years to come, until business recovers to the point where it again will be a problem for industry to meet production demands. Then the interest in special purpose equipment will be revived.

One large manufacturer believes that in production methods as they affect design there is undoubtedly an appreciable demand for greater flexibility and even greater mobility of units. Definite proof of this statement has been established by L. F. Maurer, Pierce Arrow Motor Car Co., Buffalo. He asked a number of designers the question, "What is the greatest need in manufacturing equipment?" The majority replied, "Greater flexibility or versatility in tools and equipment."

This is perhaps one of the best indications that the machine tools and equipment of the near future will



undergo marked changes. Mr. Maurer says it is probable that in the next five years we may see rather radical changes in the automotive industry, some of which may even threaten the existence of present manufacturing methods. Consequently it should be mutually profitable for close contact between the two industries. The machine tool builder would have time to prepare designs of equipment and the car builder would receive better machines when they are needed.

COMMENTS of Alex Taub, development engineer, Chevrolet Motor Co., Detroit, to members of the Society of Automotive Engineers recently, carry pertinent data with which this review might well be concluded. To change with the trend is second in importance only to creating the trend. To do either we must be able to make changes without the tremendous expense of the immediate past. The greatest obstacle to mobility of change is expensive tools.

"I do not mean by this," says Mr. Taub, "that high-grade machine tools cannot be used; I mean that both large and small tools must be designed with facility for change."

Good engineering ideas or principles often are doomed because designs cannot be made economically if at all. The suggestion has been made that the engineer call in the machine tool specialist to collaborate on designs while they still are liquid. This might lead, says Mr. Taub, to the successful production of an item heretofore regarded as beyond redemption. New ideas must be given consideration even when apparently impractical from a production standpoint.

Produce Better Castings at Greatly Reduced Costs

IMPORTANCE of a better product made at a lower cost has been recognized by castings producers who, during the past year, have bent every effort toward improvement of methods, materials and equipment. Sad experience in many cases demonstrated that cut prices are in the end suicidal unless backed by a corresponding reduction in production costs, a fair margin of profit being essential.

Ruskin once said: "There is hardly anything in the world most men cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey." Foundrymen have come to realize only too well the truth in this observation.

Despite drastic curtailments which have been compelled in nearly every branch of the industry, foresighted executives for the most part have been unwilling to abandon research and technical control, work which is dependent upon continuity for success. That the industry will emerge in a healthier condition as a result of this long-range viewpoint is the opinion of Max Kuniansky, Lynchburg Foundry Co., Radford, Va.

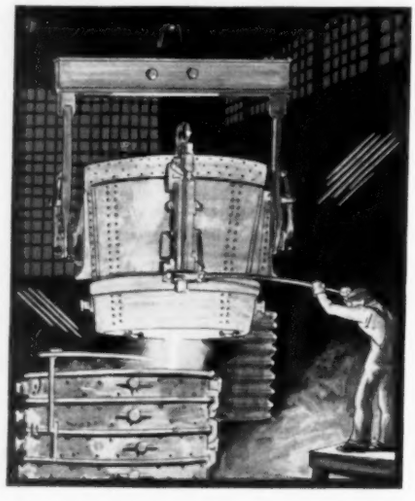
This trend is substantiated by H. S. Simpson, president, National Engineering Co., Chicago, who adds that foundries also are acknowledging the necessity of combining good engineering practice with the technical side of making castings, this being true not only of the design and shape of the casting itself, but also in connection with equipment used in the plant. Summarizing, Mr. Simpson believes that the entire industry is putting its house in order so that when the turn comes producers of castings will be in good shape to develop surely and steadily, an opinion held by many other executives and operating officials.

RECOGNITION by engineers and designers that castings are now more reliable than ever and that in designing a given mechanical unit, engineers hereafter are going to be more willing to rely upon castings for certain parts than they would have, had this period of improvement in quality not taken place, is seen by N. K. B. Patch, secretary, Lumen Bearing Co., Buffalo, as an encouraging trend. He adds that the average engineer is now more anxious to co-operate with the foundry in the perfection of the best alloy and the best design for cast parts.

Turning to developments in steel castings, the rapid rise of cast alloy steels has been evident during 1932. R. A. Bull, director, Electric Steel Founders Research Group, Chicago, declares that probably not less than 60 varieties of these alloys are now being cast, although as more facts are learned concerning their properties the number of grades will be reduced and most of the remaining varieties will be made better than at present. Maj. Bull points out that increasing alloy cast steel development naturally has resulted in need for identifying and classifying the grades. For that purpose the American Foundrymen's association now has a committee at work; and simultaneously a committee of the American Society for Testing Materials is formulating a schedule of purchase requirements, which will probably be released early this year, covering a number of grades of cast alloy steels.

Analysis Control Improved

Noteworthy progress in methods of production of alloy cast steels is seen by John Howe Hall, technical assistant to the president, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. As an instance he



cites the improvements made in the manufacture of stainless and acid-resisting cast steels, a number of plants having been equipped with steel melting units which make it possible to control the analysis of the product with the necessary accuracy; and at the same time foundry methods have been improved so that the soundness of castings produced today is much more uniform than was the case in past years. Mr. Hall notes an increased use of rust-proof steel castings for ornamental purposes.

W. H. Worrilow, president, Lebanon Steel Foundry, Lebanon, Pa., concurs in this opinion and mentions the use of selenium in corrosion-resisting steel castings where superior machining qualities are desired. Heat-resisting alloy cast steels have been developed and are finding acceptance in the oil industry for high-temperature service, according to Mr. Worrilow.

That the steel foundry has an almost limitless field in which to work, due to the flexibility possible in the analysis of steel and its treatment and the physical properties thereby obtained, is the opinion of L. S. Peregoy, president, Sivyer Steel Casting Co., Milwaukee, who declares further that the steel foundry has a most optimistic future and is preparing itself technically for it.

FACED wth an operating rate of about 10 per cent of productive capacity for a large part of 1932, castings producers naturally added no new capacity, although, as pointed out by Granville P. Rogers, managing director, Steel Founders' Society of America, New York, a few new melting furnaces were installed, largely for the purpose of more economically handling the smaller heats required for reduced production tonnages. Mr. Rogers further remarks that because of the limited business available, many steel foundries have been inclined to give a much more careful study to the merchandising of their product. Under existing conditions, engineers, designers and users have been more willing to listen to proposals for new applications for cast steel and this, it would appear, has resulted in a much more constructive type of selling than has prevailed in the business heretofore.

Notable advance has been made in the heat treatment of gray cast iron, according to James T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham, Ala., who states that in this field the nitriding process developed by Hurst is of signal importance. This process has been applied with promising results in the nitriding of centrifugally cast iron cylinder liners. Mr. MacKenzie notes that 1932 was marked by a distinct advance in the adaptation of small production units, considerable interest having been exhibited in small cupolas, rotary coal blast furnaces and the small electric furnace unit in both the rotating and direct arc types. These small units

lend themselves much more readily to diversification on high quality castings, which lately have been the order of the day.

Mr. MacKenzie also cites activity on the part of the British Cast Iron Research association in the study of heat-resisting cast iron, resulting in the developing of high-silicon plain cast iron and also high-nickel high-silicon alloys of the nicro-silal type, the latter avoiding some of the brittleness to which the plain silicon irons are subject.

A further important development in gray iron metallurgy was the publication of revised specifications for gray iron in June by the American Society for Testing Materials. The new specifications, as pointed out by Arthur J. Tuscany, manager, Gray Iron institute, Cleveland, an organization active in recommending the revisions, provide for three sizes of test bars—0.875, 1.2 and 2.0-inch diameters—and for several classes of gray cast iron corresponding to tensile strengths of 20, 25, 30, 35, 40, 50 and 60 thousand pounds per square inch minimum.

With the recent completion of these specifications, Mr. Tuscany points out, engineers, designers and other castings users have a much closer check then was possible previously. Factors of safety can be employed, based on more complete data, and the quality of iron received checked more carefully.

VALUE of these new specifications is reiterated by R. S. MacPherran, metallurgist, Allis-Chalmers Mfg. Co., Milwaukee, and J. W. Bolton, Lunkenheimer Co., Cincinnati. Mr. Bolton, surveying the year's developments, states that much interest awaits the as yet unpublished investigation of impact testing, being conducted under the supervision of Mr. MacKenzie, the most extensive investigation of its type ever undertaken, covering in addition to impact testing all the usual mechanical and chemical tests applied to a wide variety of cast irons.

Opportunity afforded by slack times to study service records on machines and equipment has given rise to a keener interest on the part of builders of this equipment in obtaining castings, particularly gray iron castings, of higher quality, designed and produced to render maximum service, according to R. F. Harrington, metallurgist, Hunt-Spiller Mfg. Corp., Boston. This interest, therefore, has permitted the manufacturer of high quality castings to extend his field even in these times of lessened demand.

In the malleable castings field, as well as in others, developments in all directions appear to be strongly along the line of reducing costs, declares H. A. Schwartz, manager of research, National Malleable & Steel Castings Co., Cleveland, who observes that mechanization of the foundry has, perhaps, come temporarily to a halt or at least greatly slowed up due to the difficulties of financing such changes, especially among the weaker industries.

Dr. Schwartz continues: "Interest seems to be turning rather strongly under these circumstances in the direction of encroachment by foundry products into fields previously occupied by other materials; thus we have witnessed the approach of the cast iron crankshaft and camshaft, and of the cast integral hub and brake drum in the automotive industry.

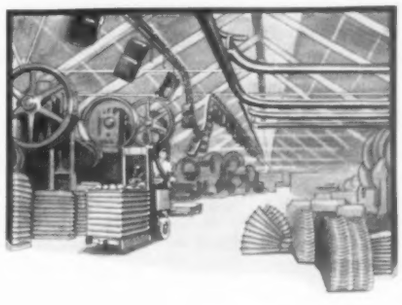
"It is of peculiar interest in the malleable business that many of these developments have been in the direction of the modification of the standard material by various alloy additions or various methods of incomplete graphitization. It appears

(*Please turn to Page* 100)

Materials Handling Equipment Helps To Reduce Production Costs

MANUFACTURERS of materials handling equipment found 1932 a lean year, for few plants made capital expenditures. Experts agree that business recovery will make purchases of machinery imperative, for production costs will be of vital importance for some time to come. Technical advances have continued without exception in the full range of equipment, including cranes, hoists, trucks and conveyors, and utilization of this equipment awaits business recovery.

The use of materials handling equipment has not been stimulated by the depression any more than other production machinery, says a crane and hoist manufacturer. Prospects for use of this type of equipment in the future are enormous, primarily because industry as a whole has not yet fully realized the



possibilities of mechanical handling as part of production processes, it being considered only as a means of handling raw material to and from storage and the finished product to the shipping platform. Among developments of the year, he concludes, might be mentioned less expensive designs with maintenance of high quality and performance characteristics.

Costs must be reduced through the saving of labor expense and where mechanical handling will effect even the smallest saving, this saving can not be ignored for it may be the difference between profit and loss, comments another hoist manufacturer. Cranes and hoists must be considered not as "labor savers," but rather "labor expense savers." There is little sense in saving labor unless there is a profit therein.

Steel mills have found production by continuous methods uneconomical during 1932, thus have turned to earlier practices by which small quantities of varying sizes could be made, according to H. H. Clark, chief engineer, Mathews Conveyer Co., Ellwood City, Pa. These earlier practices had been manual for the most part, thus the problem was to provide these old machines with modern materials handling equipment so that costs could be decreased without capital expenditure. In the design of this equipment, speed has been of great importance.

FROM a sales angle, 1932 was anything but satisfactory, but W. H. Purcell, president, Alliance Machine Co., Alliance, O., declares the lull gave his company's engineers an opportunity to develop some new ideas. Among these developments were a full-floating, self-centering, internal hydraulic brake; a new design of worm-driven open-hearth charging machine; a unique rope reeving for hot metal cranes; an improved bridge drive mechanism; improvements in soaking pit cranes; and a gantry releasor for loosening big-end-up ingots from their molds.

Mr. Purcell predicts the application of alloy steels to the construction of cranes in the near future, this applying to structural parts as well. This would permit greater capacities, longer spans, higher speeds and lower operating costs.

Longer Life, Higher Strength Shown by New Refractories

RESEARCH work pertaining to the development of refractory materials necessarily has been somewhat curtailed as a result of the continued low state of business, but a number of interesting developments have come to the fore during 1932 nonetheless. A light-weight insulating firebrick of the semirefractory type, a low-expansion chrome-base refractory brick which shows high resistance to spalling, a new insulating brick composed of felted and pressed dead burned vermicalite, a new silica quartz pebble brick having high resistance to heat, low silica brick for soaking pits and open-hearth regenerator arches, further progress in the dry pressing of brick under high pressures, and wider application of unburned magnesite brick are a few of the high spots in a survey of the year's activity through the eyes of those active in the refractory field.

In the firebrick or "true refractory" classification a new demand has been created for brick which will give satisfactory service at high temperatures—1800-2200 degrees Fahr. —for bright annealing in artificial atmospheres such as hydrogen, according to observations made by J. C. Woodson, manager, industrial heating engineering department, Westinghouse Electric & Mfg. Co., Mansfield, O., who comments on developments from the standpoint of a user of electric resistance furnace refractories. Bright annealing is finding increasing favor in steel treating plants and a number of refractory interests are experimenting in the perfection of a suitable firebrick, Babcock & Wilcox Co., New York, now having on the market a type of brick which stands up well in this service.

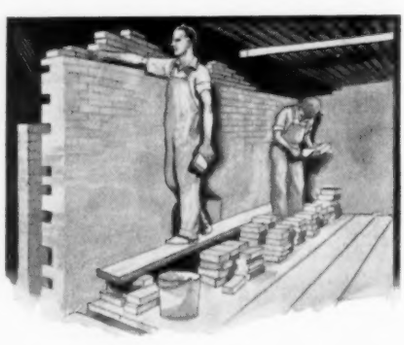
MR. WOODSON states considerable work is being done in the semirefractory brick field—brick which is appreciably lighter than firebrick, has some insulating value as compared with firebrick and yet is a refractory brick and will withstand high temperatures. Manufacturers of electric as well as oil and gas furnaces are specifying more and more of this type of brick and attempts are being made to produce a brick that is a somewhat lighter in weight, a better thermal insulator and yet mechanically stronger than the present product.

Electric furnace interests, Mr Woodson declares, would like to see a great deal of work done along the line of developing the semi-insulating type of brick, characterized by being fair insulators, capable of withstanding only medium temperatures. They are installed behind the firebrick or semirefractory brick in the furnace wall. Better insulation, more mechanical strength and greater bonding power are sought in this type of brick.

Develop New Insulator

In the field of insulating brick, a new product has been introduced by the Geo. B. Smith Chemical Works Inc., Springfield, Ill., composed of felted and pressed dead burned vermicalite, which is a low grade mica, found in some western states. Mr. Woodson states that samples of these brick in tests seem to indicate usefulness as a true insulating brick under certain conditions.

Concluding, Mr. Woodson declares: "Not a great deal of progress is being made in the refractory, semirefractory and insulating brick fields. The low state of business is undoubtedly responsible for a good part of this lack of research activity but, when times improve, furnace builders are going to want better refractories than are on the market today and they will not be available. Bonding cements for such brick are, in our opinion, in a much worse state of development than the brick themselves. We do not know of any bonding cements for insulating brick or semi-insulating brick that we consider good cements. There are only two or three commercial refractory cements that we will use at all and these only because there is nothing better available."



J. E. Brinckerhoff, sales manager, refractories department, Babcock & Wilcox Co., describes a new type of insulating firebrick which his company placed on the market in 1932. It is a light weight refractory—weighing but 2 pounds for a standard 9-inch brick—with a low thermal conductivity. It is composed of kaolin, with a porosity of about 80 per cent, and may be exposed to furnace gases directly without change up to 2850 degrees Fahr. Surface checking above this temperature may be avoided by application of a coating of high-temperature cement.

Low heat storage capacity of this brick, Mr. Brinckerhoff points out, provides a saving of fuel required in the furnace as well as a saving in time necessary for heating. Other advantages include low original furnace cost when using this brick for walls and suspended roofs, and suitability for adaptation to special shapes, since the brick may be ground to accurate size, drilled, sawed or turned on a lathe by ordinary woodworking tools.

ANOTHER recent development in refractory materials is a chrome-base brick, comprising selected and carefully processed material, manufactured under precise physical and chemical control and burned at temperatures much higher than those used for ordinary commercial refractories. This product has been developed by E. J. Lavino & Co., refractories division, Pittsburgh, and has a softening temperature said to be in excess of that of either silica or magnesite brick, a high crushing value at elevated temperatures, excellent resistance to spalling, and low expansion and heat transmission (STEEL, Dec. 19, p. 26).

G. A. Bole, research professor, engineering experiment station, Ohio State university, Columbus, O., reports the station is continuing its research into the dry press process, involving the use of gas during the forming process. The latter permits the brick to be formed under pressures much higher than those used commercially, eliminating pressure cracks or laminations normally developed during the fabricating process when pressures above 3000 pounds per square inch are used. Prof. Bole states that the process has been demonstrated under plant conditions in three cases and will doubtless be in commercial use at several plants in the near future.

New furnace problems, such as minimizing the effects of alternate heating and cooling occasioned by intermittent operations, counteracting effects of reducing atmospheres in bright annealing, and necessity for low heat storage in walls of furnaces used in continuous heating operations where quick temperature changes are necessary, have concentrated the attention of furnace builders and users upon the new light weight furnace walls made entirely

of the new semirefractory insulating brick mentioned in previous paragraphs. This active interest is pointed out by S. M. Jenkins, assistant sales manager in charge high temperature insulation, Armstrong Cork & Insulation Co., Lancaster, Pa., who adds that in order further to meet these furnace conditions, the new insulating brick are generally laid and faced with a special refractory cement developed for such purposes.

Mr. Jenkins remarks that the present lull in production has been seized by some companies as an opportunity to check over present furnace equipment to determine whether or not it is economical for production on the present basis. Studies are being made of heat efficiencies of furnace walls; of refractories and insulation to determine whether or not ceramic bonds or mixtures work together without fluxing or destroying each other; and also of service life of refractories. Use of high-temperature insulation above the floor level in open-hearth furnaces melting alloys at high temperatures is being investigated, according to Mr. Jenkins, who predicts more of this type of study this year.

A builder of electric furnaces, commenting upon the "continual striving for a super-refractory," voices the opinion that in many cases the expense of super-refractories is unwarranted, since proper design of the furnace will greatly reduce the wear and tear to which a refractory is subjected. Without intending to detract from the many advantages of some high-temperature refractories, this authority declares that electric arc furnaces, often destructive to linings if the high heat potentials available are misused, can be designed so that comparatively inexpensive refractories will give a useful life for most purposes.

SEMIREFRACTORY insulating brick elicit further comment from A. E. R. Westman, director of chemical research, Ontario Research Foundation, Toronto, Ont., who considers their successful application a development of 1932, along with the setting of insulating brick without bonding and without using mortar, and the publication of specifications and methods of test for refractory materials and a manual for interpretation of refractory test data by a committee of the American Society for Testing Materiels.

Development of certain new refractories and improvement of existing materials are cited by R. P. Heuer, director of research, General Refractories Co., Philadelphia, as being continued in the face of depressed business conditions. Mr. Heuer mentions a recent survey which showed that unburned magnesite brick absorb and give up approximately 40 per cent more heat than standard fireclay checker brick. The former also show resistance to spalling and slag corrosion, factors which have resulted in the use of unburned magnesite brick in some open hearths where frequent shutdowns have been the rule. For quick repairs to open-hearth furnace bottoms, quick set magnesite containing about 20 per cent lime is finding more general application, according to Mr. Heuer.

A promising future for the light weight insulating refractories in furnaces where it is desirable to heat up rapidly, is predicted by F. H. Riddle, director of research, Champion Porcelain Co., Detroit.

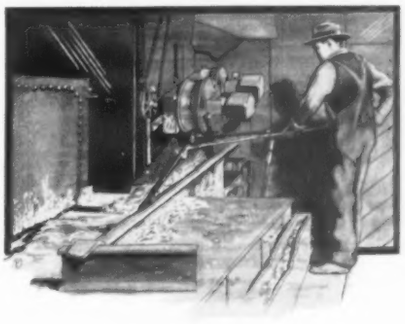
Johns-Manville, New York, is marketing a series of 11 refractory cements, in plastic and dry forms, for use in furnaces, boilers and superheaters, soaking pits, stoves, ovens etc. These cements are designed for use at maximum temperatures ranging from 2600 to 3500 degrees Fahr.

Continuous Process for Galvanizing Wire Is Simplified by New Flux

ONE of the most important developments which occurred in the galvanizing industry during the year just closed was the perfection of an entirely new flux technique as a result of the introduction of the number 20 galvanizing flux. This product, explains W. N. Spowers Jr., consulting engineer, New York, has the frothing agent self-contained and eliminates the use of muriatic acid and salammoniac flux wash as well as the bath cover in each type of operation. This technique now is in operation on straight wire, poultry netting, wire cloth, pipe, range boilers, castings, chain link fabric and other wire products.

Revolutionary Development

The new continuous wire galvanizing technique, which was developed this past year, promises to revolutionize methods of operation in this field, points out Mr. Spowers. Laboratory experiments have been completed and the first commercial installation made upon which many tons of wire already had been produced. This technique eliminates the lead annealing pan with its attendant fuel, lead and upkeep costs and places in the hands of the wire manufacturer a technique thoroughly automatic for each grade of wire and coating with the exception of the wipe where asbestos wipe is used. Recent experiment, however, gives promise of making this step of the operation also automatic in which event the hand-operated old-fashioned asbestos wipes will be eliminated.



A new method of porcelain enamel on metal construction was developed last year and placed in service in a building, comments R. A. Weaver, president, Ferro Enamel Corp., Cleveland. The exterior of the building is finished in 17¾-inch square metal enameled sections. Individual porcelain sections may be inserted or removed with little expense and the building may be dismantled or moved to another location.

Other new developments in the porcelain enameling industry, as pointed out by Mr. Weaver, include the advent of process control methods, by means of which a close check is maintained on every step of the enameling process; the greater use of magnetic separators, which remove ferrous impurities from the enamel; the greater use of brass air lines, resulting in the elimination of one source of black specks in enamel; and, the development of rubber-covered mill doors and frame, in order to eliminate possible contamination during the milling process.

THROUGH co-operation between engineers asociated with steel and rubber industries, a definite improvement has been made in the design of pickling tanks, comments Wallace G. Imhoff, president, the Wallace G. Imhoff Co., Vineland, N. J. Welded steel tanks lined with rubber are proving highly satisfactory in pickling operations, as well as for many other industrial processes where corrosion and rough usage are encountered. Nonmetallic tanks also are assisting to reduce maintenance

is subjected to acids, leakage and frequent replacement.

One of the new developments of the past year in the galvanizing industry, states Mr. Imhoff, is a hot galvanizing furnace. Important features of this unit include the large heat volume supplied at a low temperature, the even distribution of the heat, definite temperature control, accessibility in case of failure, provision for loss of metal, and the fact that the pot may fail a number of times before it has to be replaced.

Lower dross production, longer life of equipment and better bonding qualities of the coating have resulted by the use of diffusion flame combustion recently applied to galvanizing pots. The flame is luminous and gives off radiant heat. Special burners also were introduced to provide this type flame. Another new development is the use of butane and propane gas as a fuel, both of which have a high calorific value. The fuel costs compare favorably with other kinds of commercial fuels.

THE centrifugal process of handling small work such as tacks, screws, nails, rivets, bolts, all kinds of small threaded work, etc., including nuts, makes it possible to coat these articles by the hot-dip method of galvanizing and obtain a product with as smooth a coating as an electro-galvanized product.

Development in tinning and galvanizing equipment during the year just closed has been scant, states R. J. Wean, president, the Wean Engineering Co. Inc., Warren, O. The dual motor drive for actuating galvanizing machines has permitted the use of any size finishing rolls and bottom rolls. Compensation for the difference in size is had through adjustable-speed motors and control devices. The use of hot mill polishing equipment has been extended, he points out and ingenious conveying apparatus developed.

Produce Better Castings At Reduced Costs

(*Concluded from Page* 97)

likely that after many years during which the product was not acceptable unless completely ferritic, uses will now multiply for the stronger, harder and more brittle metal so produced."

E. E. Griest, president, Malleable Iron Research institute, and vice president, Chicago Railway Equipment Co., Chicago, outlines three significant developments in the malleable industry: Action of the Malleable Iron Research institute in sponsoring and urging the adoption of specifications calling for higher physical characteristics than in former specifications; development of new products, such as white iron base materials with different characteristics than malleable iron, suitable for production in malleable foundries with present equipment; and a spirit of willingness to maintain the product to the highest standard in spite of demoralized prices in many localities.

Increased interest in special high-strength and wear-resisting metals which can be produced by alloying and special heat treatment of approximately the same metal composition as used in the production of malleable iron castings is mentioned by J. B. Deisher, plant manager, Columbia Malleable Castings Corp., Columbia, Pa., as a development of the past year.

Exemplary strides have been made in the field of die castings, especially with regard to the zinc-base alloys used for this purpose. Recent developments in die design have facili-

tated short runs on medium and small-size castings from the standpoint of economy. The "unit die" system is such a development. Under this system a large master die block contains the sprue and gates for four cavities and is so constructed that four separate dies can be placed into it for as many individual die castings. Die life, as a result of precise heat treatment and improved steels, now ranges up to 500,000 castings with zinc-base alloys and ordinary pressures.

New Jersey Zinc Co., New York, during the past year introduced several new zinc-base die casting alloys containing small amounts of aluminum, magnesium and copper. Tensile strengths as cast range from about 36,000 to 47,000 pounds per square inch, elongation in 2 inches, 4 to 10 per cent; and impact strengths from 15.0 to 18.5 foot-pounds for ¼-inch square bars.

The past year has witnessed the practical introduction of the pressure casting of brass on a commercial basis, according to Charles Pack, consulting engineer, Forest Hills, Long Island, N. Y., five large manufacturers of brass castings now producing brass castings on a quantity basis in steel molds by the pressure method.

Welding Benefits from Research Studies

(*Concluded from Page* 91)

ler, chief engineer, American Institute of Steel Construction, Cleveland, states that the activities of the institute on steel battledeck floors have been followed with several types of steel floor construction covering the entire range from light residence to heavy warehouse and bridge floors. These floors, he says, are already finding their way into buildings with the certainty that they will play an increasingly important part when construction returns to normal.

CONSTRUCTION by riveting is so old as to be considered prosaic; it is accepted as an established art with its place in industry. Welding has made some inroads upon it, to be sure, but the fact remains that rivets still are used widely in large quantities.

In structural work, such as bridges and buildings, George T. Horton, Chicago Bridge & Iron Works, Chicago, believes the riveting process will continue for a long time—perhaps it never will be supplanted entirely. For all forms of containers, such as tanks, boilers, pipe, etc., however, Mr. Horton states welding undoubtedly will supplant rivets for the reason that in the design of these structures they have to be strong enough to withstand the induced stresses but must not leak when subjected to the pressures involved. The latter is in many cases the governing factor.

C. F. Newpher, manager of sales, Upson Nut division, Republic Steel Corp., Cleveland, reports no outstanding improvements made in steel rivets, although production methods have encouraged much closer tolerances than were thought possible 10 or 15 years ago. Present-day rivets, he says, can be held to any required dimension in the body, with heads more concentric. There seems to be little opportunity for further development on ordinary rivets, although there are some interesting problems in connection with alloy steel rivets.

An interesting development of the year was a new high-strength rivet-bolt fastener for lap structural joints, the use of which eliminates need for the rivet hammer and heating furnace. This fastener, a product of the Dardelet Threadlock Corp., New York, is driven into the drilled or punched holes with a light hammer, a nut is applied and drawn tight and locked with a wrench.

Tapping an open-hearth furnace—brilliant pyrotechnics of the steel industry too infrequently seen in 1932. Photo by courtesy of the Empire Steel Corp., Mansfield, O.

MARKETS PLUMB NEW LOWS IN 1932, BUT FALL RALLY HEARTENS

BY E. C. BARRINGER
Associate Editor, STEEL

NINETEEN thirty-two for iron and steel was a depression year which continued and intensified the liquidation of 1930 and 1931. In production, consumption, prices, profits and employment, the industry sank to new lows for what might be termed modern times. For a majority of executives it was the most trying year within memory.

Save for a few interests which from time to time built up moderate stocks of pig iron and semifinished steel, partly to provide work, production was entirely for consumption. And consumption, which suffered a major shock late in 1929, became increasingly paralyzed, efforts of the federal government to revive and finance it notwithstanding.

With December estimated, 1,375,000 motor vehicles were assembled in the United States in 1932, compared with 2,389,730 in 1931 and 3,355,986 in 1930. A few less than 1700 freight cars were ordered, against 10,694 in 1931 and 45,146 in 1930. Structural steel awards as compiled weekly by STEEL were 845,000 tons, contrasted with 1,780,263 tons in 1931 and 1,832,601 tons in 1930. No large pipe lines were laid; most shipyard ways were vacant; manufacture of farm equipment was negligible.

The sequel was an output of 8,710,000 gross tons of coke pig iron, less than half the 18,263,011 tons tapped in 1931 and scarcely more than one-fourth the 31,441,488 tons of 1930. Since 1896, no year was so poor. Production of open-hearth and bessemer steel ingots was 13,109,000 gross tons, one-half the 25,533,012 tons of 1931 and one-third the 40,084,631 tons of 1930. This was the lowest since 1900.

If measured by the iron and steel composite of STEEL, the decline in prices in 1932 was relatively less than the shrinkage in production. For last year the average of this weekly index of 25 pig irons and semifinished and finished steels was $29.46, compared with $31.15 for 1931 and $33.52 for 1930. Semifinished and finished products, with several outstanding exceptions, were steadier than pig iron and scrap.

Noteworthy among many price adjustments

made in the year was the reduction Oct. 20 of $3 per ton in rails, first revision since the $43 level was adopted Oct. 1, 1922. Shortly afterward, track fastenings were sympathetic to the extent of $2 to $4 per ton .Tin plate was lowered $10 per ton to $4.25 per base box late in November for 1933 contracts.

If the experience of ten important producers, representing about 80 per cent of the country's steelmaking capacity was typical, the average loss per ton of ingots poured rose from $7.72 in the first quarter to $13.78 in the second quarter to $17.53 in the third quarter, with the loss in the fourth quarter equaling the third.

These heavy deficits were encountered despite the sharpest retrenchment in the history of the industry. A 10 per cent reduction in wages, effective Oct. 1, 1931, by the United States Steel Corp. and followed by other producers, having proved insufficient to stem the tide, a 15 per cent reduction was ordered by the Steel corporation May 15. By late 1932 the aggregate wage adjustment of some producers exceeded 30 per cent, and considering the short week and enforced vacations, salaries suffered more than wages.

In the face of these enormous losses there were no casualties among the larger producers and no outstanding mergers traceable to distress. Major changes in the industry in 1932 included: Pickands, Mather & Co. acquired the pig iron and coke sales business of Pickands, Brown & Co. Jan. 1; Corrigan, McKinney Steel Co. and Newton Steel Co. affiliated Aug. 16; Bethlehem Steel Corp. absorbed the Seneca Iron & Steel Co. Nov. 1; American Steel & Wire Co. June 1 leased the Minnesota Steel Co.

New Generation Rises In U. S. Steel Corp.

INTERNAL reorganizations were numerous. Touched off by the resignation of James A. Farrell, as president, under the new retirement provisions, William A. Irvin became head of the United States Steel Corp. April 19 as the first of a series of changes which brought Myron C. Taylor to the chairmanship of the Steel corporation and new presidents to the Illinois Steel Co., Tennessee Coal, Iron & Railroad Co., American Steel & Wire Co., Columbia Steel Co. and Canadian Steel Corp. Ltd., and a comparable adjustment in vice presidents. Both the Carnegie Steel Co. and Bethlehem Steel Corp. unified their general sales staffs, and a consolidation of traffic activities of the Steel corporation at Pittsburgh and Chicago was effected.

One effect of depressed 1932, which will become more apparent as the industry recovers, is the appraisal of plants as high or low-cost producers, and a trend toward concentrating production in the latter. Typical was the decision of the Steel corporation to abandon its Newburgh steelworks in Cleveland. It was a matter of economy for producers, especially those on the Great Lakes, to operate a few plants and from them ship semifinished material to finishing departments of other plants.

A quickened American Iron and Steel institute was born of the necessity for co-ordinated action, especially in combating imports of iron and steel which at times assumed the aspect of dumping. Robert P. Lamont, secretary of commerce under President Hoover, became president of the institute Aug. 18, Charles M. Schwab moving up to chairman and chief executive. The institute was active all through the year in filing dumping charges and asking that flexible provisions of the tariff law be invoked.

Imports Are Steady, but Decline Hits Exports

A FAVORABLE balance of foreign trade was only narrowly maintained in 1932. In ten months, exports of iron and steel products totaled 484,532 gross tons, or little more than half of the 852,177 tons moved abroad in ten months of 1931. But imports of 313,968 tons in this period were close to the 360,643 tons of 1931. An additional handicap, which grew menacing in 1931, became a fact on Oct. 13 when Canada imposed greatly increased duties, and actively began diverting its requirements to British producers. A fresh burden on trade, both domestic and export, was the surcharge on railroad freight rates effective Jan. 4.

Apparently ineffective from the standpoint of supplying impetus for a marked revival of business, but a powerful influence in preventing the depression from cutting deeper, were the various relief measures proposed by the Hoover administration and enacted by a sometimes-reluctant congress. In mid-January the Reconstruction Finance Corp., with a capital of $2,000,000,000, succeeded the National Credit Corp., organized in October, 1931, and began to thaw frozen credits and make loans to the railroads, banks and farmers.

A threat to the gold standard was averted by the Glass-Steagall act of Feb. 27. Prior to adjournment, congress passed a relief bill appropriating $3,200,000,000 chiefly for postoffice and other federal construction. In the early fall the R. F. C. began to finance self-liquidating projects which were estimated to require 1,218,250 tons of steel. At conferences with business and industrial leaders in August the President set up committees to stimulate rehabilitation of industrial equipment and spread employment.

From raw materials to the most finished product, the depression played no favorites. Great Lakes shipments of iron ore at 3,567,985 tons were the lowest in 46 years and a scant one-sixth of the 23,467,786 tons in what had been considered a poor 1931. But this meager movement put lower lake stocks down to 32,100,000 tons Dec. 1, or 8,100,000 tons below December, 1931.

So attenuated were the requirements of many melters of pig iron that their supplies were moved in by truck. Outstanding in domestic business was a purchase of 50,000 tons of foundry by the American Radiator Co. and 25,000 tons of basic by the Allegheny Steel Co. One eastern pipe maker purchased nearly 50,000 tons of British and Dutch iron, while Japanese and Manchurian iron was offered as far into the interior as Pittsburgh.

Ferromanganese began the year at $75, duty paid, but declined to $68 in June, spiegeleisen being sympathetic by easing from $27 to $25 and later to $24. The $68 ferromanganese price was extended into the first half of 1933.

In both the foundry and furnace grades the price tendency in beehive coke in 1932 was downward. Foundry began the year at $3.25, Connellsville ovens, and ended it at $2.50; furnace went off from $2.25 to $1.80. In the late spring or early summer most by-product coke prices declined about 50 cents, then remained pegged the rest of the year.

Because scrap frequently is barometric, the rise in price and expansion of demand from late August through October was heartening. But support left this market almost as rapidly as it had rallied, and by the end of the year almost all of the price gain was surrendered.

Rail Buying Is Meager; Shape Needs Disappoint

RAIL contracts in 1932 totaled 200,000 tons, compared with an actual production of 1,157,751 gross tons in 1931. The Erie bought 31,377 tons, Nickel Plate 20,000 tons and New York Central 30,000 tons, but not all was released. The Pennsylvania specified 20,000 tons. Notable among infrequent orders for freight cars were 1285 by the Pennsylvania. With R. F. C. assistance, the New York Central began repairs on 13,000 box cars, with smaller programs by the Reading, Baltimore & Ohio, New Haven and other carriers.

Failure of the structural steel market to snap back as the result of government financing of public works was probably the greatest disappointment of the year. Pending work was large, but closing was tortuous. Heaviest of all awards was 75,000 tons for the Golden Gate bridge at San Francisco, a holdover from 1931. Proceeding despite the unsettled general aspect was the Rockefeller Center in

New York, to which 81,000 tons was shipped and erected. Plans for the San Fancisco Bay bridge, requiring 200,000 tons, reached the stage where bids were ordered for Feb. 2, 1933. The eastern market was handicapped by the absence of subway construction in New York, which normally was good for 200,000 tons.

Demand for plates, bars, strip, bolts, nuts and rivets and other finished products reflected the minimum requirements of consumers at all times. In March, a differential of $4 a ton over the Pittsburgh base was established as the Detroit market on carbon bars. In August, bars 1 to 1½-inch took $3 up for commercial forging quality, and ½-inch and over $5 up.

In June, a single price replaced the former division of hot-rolled strip into two widths. Sheets were under severe pressure from automotive buyers, cold-rolled yielding $5 a ton, with a tendency toward the use of No. 20 cold-rolled in place of No. 20 autobody. On May 16, cold-finished bar interests adopted a single price basis with deductions of 5 to 12½ cents per 100 pounds on quantities.

Heavy Finished Steel 1.60c Most of Year

STEEL bars, shapes and plates opened the year on the basis of 1.55c, Pittsburgh, eased off to 1.50c in February, regained 1.55c in March and went to 1.60c in April, remaining there. Concessions on fabricated erected structural material were severe, and to prevent the disturbance injuring the plain material market producers of shapes quoted this material delivered on the job.

Largest of steel pipe orders during the year were 8000 tons for the Southern Counties Gas Co., booked by Republic Steel Corp., and 8000 tons as the participation of American mills in the Iraq pipe line. Discounts on steel and wrought pipe and standard commercial seamless boiler tubes were revised.

Generally, the market on refractories in 1932 was weak. Fire clay brick was $38 until May, then cut $3. Magnesite brick declined during the year from $65 to $61.50, and chrome brick from $45 to $42.50. Most shipments were from stock.

Coke oven by-products remained moderately steady in price during 1932, the shrinkage in demand being paralleled by a contraction in output. Sulphate of ammonia was the most erratic of the group of by-products. Naphthalene distributors placed flakes and balls on an even basis for the first half of 1933 contracts.

The year marked a period of generally declining prices and demand in the nonferrous metal markets as more severe phases of the depression developed.

Despite agreement of 90 per cent of world copper producers early in 1932 on curtailment of production to 20 per cent, prices continued to fall as lagging consumption resulted in further accumulations to the already heavy stocks which overburdened the market.

Even the levying of a 4-cent tariff by the United States June 21 failed to prevent the decline in the domestic price late in the year to the all-time low of 5.00c, Connecticut basis. European prices fell well below this level. Failure of world producers to renew their agreement for continued curtailment of production in 1933 left the copper market in an uncertain position as the year closed.

Zinc dropped to a record low of 2.30c, East St. Louis, near the middle of the year due to heavy stock accumulations. However, determined efforts at curtailment by both ore and metal producers brought the price well above this level late in the year.

Lead dropped to a new low of 2.50c, East St. Louis, and 2.65c, New York, but later recovered somewhat. Little improvement was effected in the stock position.

Straits tin dropped to 18.35c, New York, in April but had reached a high of 25.70c for the year by September, which accompanied a gradual decline in world visible supplies as the result of activities of the International Tin Cartel. Prices later declined considerably from the year's high under the influence of falling sterling exchange and further recession in consumption.

Bar silver dropped to a record low of 24.87½c an ounce. Antimony was quoted the lowest in ten years. Nickel and aluminum held at 35.00c and 22.90c, respectively, through the year.

Canadian Output Also Low; Prices Move Little

CANADA, like the United States, felt the heavy hand of the depression. Capacity was engaged an average of less than 20 per cent, which also gages consumption and was relieved only by minor flurries.

With December estimated, Canadian output of pig iron in 1932 was 116,950 gross tons, compared with 420,038 in 1931, 747,178 in 1930 and 1,080,160 tons in record 1929.

Steel ingots poured in Canada in 1932 totaled 298,308 gross tons, against 637,997 tons in 1931, 957,430 tons in 1930 and the record of 1,309,543 tons in 1929.

As in the United States, the lack of railroad business was disastrous. Farm implement output was nil, and automobile requirements were fair only early in the year.

Prices in the dominion were relatively stable. Semifinished and finished material underwent minor revisions. Pig iron quotations were largely unchanged. Iron and steel scrap was comparatively stable, for one thing because with the Canadian dollar at a discount, increased freight rates and duty, United States dealers were unable to meet prices quoted by Canadian producers.

The Imperial Economic conference held at Ottawa, Ont., in the late summer resulted in rather drastic tariff revisions for the purpose of building up trade within the empire. The full effects, however, could not be appraised because of the generally low state of trade.

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In the compilation of the foregoing market review B. K. Price, L. E. Browne and C. G. Stewart, New York; W. G. Gude, Chicago; Edward A. France Jr., Pittsburgh; A. J. Hain, G. H. Manlove and I. H. Such, Cleveland; and F. S. Tobin, Toronto, Ont., participated.

Some Rebound in 1933 Is Believed Inevitable

NEVERTHELESS, 1932 was not without a modicum of encouragement. As in 1931 and 1930, there was a fillip in the production of both pig iron and steel ingots in the first quarter. But in 1932, September, October and November staged a notable rally, whereas in the two preceding years the trend was steadily downward from the first quarter. In ingots, the fall upturn was limited to September and October, but even so this was twice the duration of the fall rise in 1931.

Buttressed more by hope than fact, the iron and steel industry enters 1933 confident it will regain some measure of prosperity. Palpably the consumption of steel last year, as measured by production which engaged only 19 per cent of capacity, was short of the deterioration of steel in use. After three successive increasingly violent years of depression, the industry believes it must have shaken out practically all of the excesses which culminated in 1929.

Normally, activity begins to mount as the new year is turned, for one reason because of the automatic release of rail tonnage. The railroads, confronted with an adjustment in wages, have withheld their customary commitments, indicating that January operations will lack their support. The change in the national administration March 4 remains to be appraised from the standpoint of industry, although a major disturbance is not anticipated.

Hence the majority opinion that the trail back in iron and steel will be negotiated slowly and painfully, but that the double bottom in production in the July 4 week and the year-end holidays will prove a springboard for 1933.

Domestic Average Monthly Prices in 1932

Base or furnace, unless otherwise specified. Scrap is delivered to consumers

PITTSBURGH

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bessemer Pig Iron, delivered	$17.26	$16.96	$16.76	$16.76	$16.13	$15.95	$15.76	$15.76	$15.76	$15.76	$15.76	$15.76
Basic Pig Iron, delivered	15.00	15.00	15.00	15.00	15.00	14.50	14.00	14.00	14.00	14.00	14.00	14.00
No. 2 Foundry Pig Iron, delivered	17.26	16.76	16.51	16.26	16.16	16.01	15.76	15.76	15.76	15.76	15.76	15.76
Malleable Pig Iron, delivered	16.00	15.50	15.50	15.50	15.00	14.50	14.50	14.50	14.50	14.50	14.50	14.50
Bessemer Ferrosilicon, 10 per cent (Jackson county base)	23.00	22.00	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50
Billets, Bessemer and Open-Hearth	$27.50	$27.00	$27.00	$27.00	$27.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00
Sheet Bars, Bessemer and Open-Hearth	27.50	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00
Wire Rods	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
Furnace Coke, spot	$2.25	$2.25	$2.25	$2.25	$2.15	$2.00	$2.00	$2.00	$2.00	$2.00	$1.80	$1.80
Foundry Coke, spot	3.25	3.25	3.25	3.25	3.15	3.00	3.00	2.90	2.75	2.75	2.65	2.50
Structural Shapes	1.55c	1.50c	1.55c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c
Plates	1.55	1.50	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Bars	1.55	1.50	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Cold-Finished Steel Bars	2.00	2.00	1.90	1.90	1.75	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Strip, Hot-Rolled (narrow up 10c to July 1)	1.40	1.40	1.40	1.45	1.50	1.50	1.45	1.45	1.45	1.45	1.45	1.45
Strip, Cold-Rolled	2.00	1.90	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.95	2.00	2.00
Steel Pipe, 1 to 3-inch discount	64%	64%	64%	64%	64%	64%	64%	64%	67½%	67½%	67½%	67½%
Standard Spikes	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.40	2.40	2.40
Wire Nails	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
Plain Wire	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Structural Rivets	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
No. 24 Hot-Rolled Annealed Sheets	2.20	2.15	2.20	2.20	2.20	2.20	2.20	2.15	2.10	2.10	2.10	2.20
No. 9-10 Blue Annealed Sheets	1.75	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
No. 24 Galvanized Sheets	2.80	2.75	2.80	2.85	2.85	2.85	2.85	2.80	2.75	2.80	2.85	2.85
Tin Plate, base box	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.50	$4.25
Heavy Melting Steel Scrap	$10.25	$10.25	$10.25	$10.20	$9.75	$9.00	$8.35	$8.55	$9.50	$9.50	$9.15	$8.75
Low Phosphorus Scrap	13.90	13.00	13.15	13.85	13.00	12.00	10.60	10.50	10.50	10.60	10.75	10.50
No. 1 Cast Scrap	10.00	9.80	9.50	9.50	9.20	9.00	8.60	8.50	9.50	9.50	9.25	9.00

CHICAGO

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. 2 Foundry and Malleable Pig Iron	$16.50	$16.50	$16.50	$16.00	$15.60	$16.00	$15.50	$15.50	$15.50	$15.50	$15.50	$15.50
Southern No. 2 Foundry Pig Iron, delivered	16.29	16.01	16.01	16.01	16.01	16.01	16.01	16.01	16.01	16.01	16.01	16.01
Lake Superior Charcoal Iron	22.29	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04
Bar Iron	1.60c	1.70c	1.70c	1.70c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c
Rail Steel Bars	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Bars	1.70	1.60	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Structural Shapes	1.70	1.60	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Plates	1.70	1.60	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
No. 24 Hot-Rolled Annealed Sheets	2.45	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.25	2.25	2.25
Heavy Melting Steel Scrap	$7.25	$6.80	$6.75	$6.55	$6.20	$5.60	$4.50	$5.40	$5.75	$6.00	$5.75	$5.50
No. 1 Railroad Wrought Scrap	7.25	6.85	6.25	5.85	5.25	5.00	4.60	4.50	5.60	5.60	5.60	5.00
Rails for Rolling	10.30	9.85	9.50	8.90	8.25	7.75	6.60	6.50	7.00	8.00	8.25	8.00
Car Wheels, Iron	7.75	7.00	7.00	6.75	6.35	6.00	5.50	6.15	7.00	7.00	7.10	7.00
No. 1 Machinery Cast Scrap	8.90	8.90	8.40	7.85	7.00	6.40	6.15	6.45	7.30	7.30	6.85	6.70

EASTERN PENNSYLVANIA

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Basic Pig Iron	$16.00	$15.75	$15.75	$15.00	$15.00	$14.50	$14.25	$13.85	$13.75	$13.60	$13.50	$13.50
No. 2X Foundry Pig Iron, delivered, Philadelphia	15.76	15.76	15.76	15.66	15.135	14.76	14.76	14.38	14.26	14.01	13.95	13.76
No. 2X Virginia Pig Iron	18.00	18.00	18.00	18.00	18.00	18.00	18.00	17.81	17.75	17.75	17.75	17.75
Standard Low Phosphorus Pig Iron	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50
Tank Plates, delivered, Philadelphia	1.695c	1.695c	1.695c	1.795c	1.795c	1.795c	1.795c	1.795c	1.795c	1.77c	1.77c	1.745c
Structural Shapes, delivered , Philadelphia	1.65	1.62	1.66	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.70
Bars, delivered, Philadelphia	1.81	1.81	1.83	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91
Bar Iron, common, delivered, Philadelphia	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.81	1.81	1.81	1.81
No. 10 Blue Annealed Sheets, delivered, Philadelphia	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
No. 1 Heavy Melting Steel Scrap, delivered	$7.50	$7.35	$7.35	$7.20	$6.50	$6.25	$6.25	$6.40	$7.25	$7.25	$7.25	$6.50
No. 1 Railroad Wrought Scrap, delivered	9.35	9.00	9.00	7.95	7.75	6.70	6.25	6.25	7.25	7.25	7.25	6.50
No. 1 Cupola Cast Scrap, delivered	11.20	10.00	10.00	9.50	9.25	9.00	9.00	9.125	9.25	9.00	9.00	9.00

COAL TAR PRODUCTS

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Benzol, per gallon producers' plants, tank lots	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20	$0.20
Toluol, per gallon producers' plants, tank lots	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Solvent Naphtha, per gallon producers' plants, tank lots	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Phenol, per pound producers' plants in 250 lb. drums	0.165	0.165	0.165	0.163	0.163	0.163	0.163	01.63	0.163	0.163	0.163	0.163
Naphthalene Flakes, per pound producers' plants	0.0375	0.0375	0.0375	0.0375	0.0375	0.0375	0.0375	0.0375	0.0375	0.0475	0.0475	0.0475
Naphthalene Balls, per pound producers' plants	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475	0.0475
Sulphate of Ammonia, per 100 lbs., Atlantic seaboard	1.15	1.15	1.15	1.10	1.15	1.00	1.375	1.375	0.875	1.0525	1.0525	1.0525

NONFERROUS METALS

Prompt, wholesale prices in cents per pound

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Tin, spot, Straits, New York	21.850	22.030	21.852	19.261	20.950	19.658	20.929	22.992	24.806	23.930	23.344	22.690
Copper, electro, delivered, Connecticut	7.338	6.228	6.000	5.793	5.473	5.365	5.285	5.425	6.205	5.988	5.378	5.047
Zinc, prime western, East St. Louis	3.015	2.861	2.787	2.728	2.522	2.793	2.546	2.761	3.321	3.041	3.097	3.126
Lead, open market, East St. Louis	3.550	3.516	2.993	2.900	2.900	2.887	2.592	3.092	3.318	2.941	2.933	2.877
Lead, open market, New York	3.750	3.717	3.150	3.000	3.000	2.985	2.734	3.235	3.971	3.464	3.057	3.000
Aluminum, 98-99½, delivered	22.900	22.900	22.900	22.900	22.900	22.900	22.900	22.900	22.900	22.900	22.900	22.900
Antimony, spot, New York	6.016	6.522	6.166	5.804	5.183	5.083	5.000	5.217	5.595	5.601	5.828	5.440
Nickel, ingot	35.000	35.000	35.000	35.000	35.000	35.000	35.000	35.000	35.000	35.000	35.000	35.000

Prices Tell Market History

Ores and Alloys

Per Gross Ton

Iron Ore Prices at Date of Buying Movement

Season	Date buying movement	Old range Bessemer Ton	Old range Bessemer Cents per unit	Old range Nonbessemer Ton	Old range Nonbessemer Cents per unit	Mesabi Bessemer Ton	Mesabi Bessemer Cents per unit	Mesabi Nonbessemer Ton	Mesabi Nonbessemer Cents per unit	Iron prices, Valley Bessemer	Iron prices, Valley No. 2 Foundry
1932	June 3, 1932	$4.80	9.320	$4.65	9.029	$4.65	9.029	$4.50	8.738	$14.50	$14.50
1931	April 15, 1931	4.80	9.320	4.65	9.029	4.65	9.029	4.50	8.738	17.00	17.00
1930	April 1, 1930	4.80	9.320	4.65	9.029	4.65	9.029	4.50	8.738	19.00	18.50
1929	March 22, 1929	4.80	9.320	4.65	9.029	4.65	9.029	4.50	8.738	18.50	18.00
1928	April 16, 1928	4.55	8.835	4.40	8.544	4.40	8.544	4.25	8.252	17.50	17.25
1927	April 8, 1927	4.55	8.835	4.40	8.544	4.40	8.544	4.25	8.252	19.50	18.50
1926	March 17, 1926	4.55	8.835	4.40	8.544	4.40	8.544	4.25	8.252	21.00	20.50
1925	April 4, 1925	4.55	8.835	4.40	8.544	4.40	8.544	4.25	8.252	22.00	21.00
1924	March 24, 1924	5.65	11.364	4.90	10.680	5.40	10.909	4.75	10.388	23.00	22.00
1923	March 24, 1923	6.45	12.818	5.70	12.233	6.20	12.364	5.55	11.942	31.00	31.00
1922	June 9, 1922	5.95	11.909	5.20	11.262	5.70	11.454	5.05	10.971	25.00	24.00
1921	June 16, 1921	6.45	12.818	5.70	12.233	6.20	12.364	5.55	11.942	23.00	22.50
1920	Feb. 2, 1920	7.45	14.636	6.70	14.175	7.20	14.182	6.55	13.883	41.00	40.00
1919	April 28, 1919	6.45	12.818	5.70	12.233	6.20	12.364	5.55	11.942	27.95	26.75
*1918	Oct. 1, 1918	6.65	13.182	5.90	12.621	6.40	12.727	5.75	12.330	35.20	34.00
	July 1, 1918	6.40	12.727	5.65	12.136	6.15	12.273	5.50	11.845	35.20	33.00
	April 1, 1918	5.95	11.909	5.20	11.262	5.70	11.454	5.05	10.971	35.20	33.00
1917	Nov. 22, 1916	5.95	11.909	5.20	11.262	5.70	11.454	5.05	10.971	30.00	26.00
1916	Dec. 7, 1915	4.45	9.181	3.70	8.349	4.20	8.727	3.55	8.058	18.50	18.00
1915	April 19, 1915	3.75	7.909	3.00	6.990	3.45	7.455	2.80	6.699	13.60	12.75
1914	May 1, 1914	3.75	7.909	3.00	6.990	3.50	7.445	2.85	6.699	14.00	13.25
1913	Nov. 19, 1912	4.40	9.091	3.60	8.155	4.15	8.636	3.40	7.767	17.25	17.50
1912	March 20, 1912	3.75	7.909	3.00	6.990	3.50	7.455	2.85	6.690	14.25	13.25
1911	April 21, 1911	4.50	9.273	3.70	8.349	4.25	8.818	3.50	7.961	15.00	13.75
1910	Dec. 24, 1909	5.00	10.182	4.20	9.320	4.75	9.727	4.00	8.932	19.00	17.25

*Prices for 1918 established by government. All iron ore prices, delivered lower lake ports.

Manganese Ore, 1915-1932

Dollars Per Gross Ton, Duty Paid, North Atlantic Ports, on Basis of 50 Per Cent Ore

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$22.70	$22.70	$22.70	$22.70	$21.70	$21.70	$21.70	$21.70	$21.20	$21.20	$21.20	$20.70
1931	24.20	24.20	23.70	23.70	23.70	23.70	23.70	23.70	23.70	22.70	22.70	22.70
1930	24.95	24.70	24.70	24.70	24.70	24.70	24.70	24.20	24.20	24.20	24.20	24.20
1929	27.70	27.70	27.70	27.70	27.70	27.70	26.70	26.70	26.70	25.70	25.70	25.70
1928	30.20	30.20	30.20	30.20	30.20	30.20	30.20	30.20	30.20	30.20	29.20	29.20
1927	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70
1926	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70	30.70
1925	32.20	32.70	33.20	33.20	32.70	32.20	32.20	32.20	31.70	31.70	31.70	31.70
1924	31.20	32.70	23.20	32.20	32.20	31.70	30.70	30.20	30.20	30.20	31.70	32.20
1923	29.45	29.45	31.70	33.20	32.70	32.95	32.95	32.95	31.70	31.70	31.70	31.70
1922	10.50	11.00	12.50	12.75	12.75	13.25	13.50	13.75	*14.35	25.50	25.50	25.50
1921	18.75	17.50	17.25	14.00	14.00	12.50	12.50	12.50	12.50	12.50	12.50	12.00
1920	30.00	38.75	38.75	32.25	35.00	37.50	42.25	35.00	35.00	32.75	25.00	21.25
1919	55.50	38.75	37.50	30.00	30.00	30.00	31.25	31.25	30.00	27.50	27.50	27.50
1918	63.75	63.75	60.00	65.00	65.00	65.00	68.50	65.00	65.00	65.00	62.50	55.00
1917	30.00	30.00	40.00	40.00	50.00	50.00	50.00	50.00	60.00	60.00	60.00	60.00
1916	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	30.00	30.00	30.00	30.00
1915	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	22.50	22.50	22.50	22.50

*After September, 1922, duty 1c per pound metallic content, $11.20 per gross ton 50 per cent ore.

Bessemer Ferrosilicon, 10 Per Cent, 1916-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$23.00	$22.00	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50
1931	25.00	25.00	25.00	25.00	25.00	25.00	25.00	24.00	23.00	23.00	23.00	23.00
1930	30.00	30.00	30.00	30.00	30.00	29.50	29.00	29.00	25.00	25.00	25.00	25.00
1929	31.00	31.00	31.00	31.00	31.00	31.00	31.00	30.20	30.00	30.00	30.00	30.00
1928	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
1927	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	33.50	32.00	30.00
1926	35.00	35.50	36.00	34.40	33.00	33.00	33.00	33.00	33.00	33.25	24.00	34.00
1925	39.50	39.50	39.50	37.50	35.50	35.50	35.50	35.50	34.00	33.50	34.25	35.00
1924	41.50	42.50	42.25	41.50	40.30	39.50	39.50	39.50	39.50	39.50	39.50	39.50
1923	44.50	45.50	47.10	48.50	48.50	48.00	46.50	43.50	43.50	43.50	41.50	41.50
1922	38.50	37.50	36.50	37.25	40.50	41.50	41.50	42.50	48.50	50.00	48.00	44.50
1921	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	52.50	57.50
1920	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50
1919	54.00	54.00	52.95	47.40	45.00	47.40	49.75	49.75	49.75	49.75	54.75	58.50
1918	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	57.00	57.00	57.00
1917	42.00	42.00	49.80	57.00	67.00	82.50	92.25	95.00	95.00	95.00	55.00	55.00
1916	28.00	28.00	31.00	31.00	32.00	32.00	32.00	31.80	30.25	30.50	34.60	42.00

Ferrosilicon, 50 Per Cent, 1916-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$77.50	$76.30
1931	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	77.50
1930	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50
1929	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50
1928	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50	83.50
1927	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
1926	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
1925	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
1924	75.00	75.00	75.00	75.00	75.00	75.00	74.50	74.50	74.50	75.00	75.00	82.50
1923	85.00	90.00	92.50	95.00	95.00	87.50	82.50	82.50	82.50	82.50	80.00	75.00
1922	57.50	55.00	54.00	55.00	57.50	57.50	55.00	55.00	55.00	70.00	82.50	82.50
1921	80.00	92.00	93.00	90.00	80.00	75.00	75.00	65.00	65.00	60.00	60.00	57.00
1920	82.00	80.00	83.00	80.00	83.00	82.50	82.50	80.00	82.50	82.50	80.00	80.00
1919	145.00	125.00	115.00	110.00	110.00	85.00	80.00	78.00	80.00	85.00	80.00	80.00
1918	175.00	175.00	177.50	172.50	170.00	170.00	165.00	153.50	150.00	151.00	150.00	150.00
1917	122.50	156.25	175.00	187.50	230.00	230.00	237.50	225.00	212.50	171.25	157.50	172.50
1916	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	94.25	95.00	95.00

Spiegeleisen, 1915-1932

At Producers' Furnaces

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$27.00	$27.00	$27.00	$27.00	$27.00	$26.50	$25.00	$25.00	$25.00	$25.00	$24.25	$24.00
1931	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	27.00
1930	34.00	34.00	34.00	34.00	34.00	34.00	33.00	33.00	33.00	33.00	33.00	30.00
1929	34.00	34.00	34.00	34.00	34.00	34.00	34.00	33.20	33.50	34.00	34.00	34.00
1928	32.00	32.00	32.00	32.00	32.00	32.00	33.00	33.00	33.00	33.00	33.00	34.00
1927	37.00	37.00	37.00	37.00	35.50	34.80	34.00	33.35	33.00	30.15	30.00	31.00
1926	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	38.75	37.00
1925	32.00	33.00	33.00	33.00	33.00	32.00	31.50	32.25	33.00	33.00	34.00	34.00
1924	39.00	39.00	38.00	38.00	36.75	36.00	35.00	32.50	32.00	31.00	31.75	31.00
1923	34.90	35.75	37.25	39.25	43.00	46.00	45.00	45.00	43.50	40.00	39.00	38.00
1922	25.50	28.00	28.00	30.00	35.00	35.25	35.00	37.00	38.00	37.75	36.80	35.50
1921	46.25	37.75	34.20	32.00	31.75	29.60	27.50	26.20	25.25	24.85	25.00	25.00
1920	46.60	57.60	60.40	66.85	75.00	75.00	75.00	79.35	82.00	80.00	74.35	57.90
1919	*67.50	*52.50	*42.50	*34.50	*31.35	*27.50	34.00	34.00	34.00	34.00	34.00	39.00
1918	59.00	59.00	65.50	*70.00	*71.00	*75.00	*75.00	*75.00	*75.00	*75.00	*75.00	*72.50
1917	57.50	66.25	77.50	76.75	78.00	83.00	85.00	81.25	80.50	73.50	63.25	60.00
1916	32.50	42.50	55.00	60.00	60.00	55.00	47.50	47.50	45.00	40.00	45.00	50.00
1915	25.00	25.50	26.00	26.00	26.00	26.00	26.00	26.00	29.00	30.00	30.00	30.00

*Prices from and including April, 1918, and to and including June, 1919, are for 16 per cent spiegeleisen. All other prices apply to 20 per cent metal.

Ferromanganese, Delivered, Pittsburgh, 1914-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$79.85	$80.24	$80.24	$80.24	$80.24	$74.99	$73.24	$73.24	$73.24	$73.24	$73.24	$73.24
1931	89.79	89.79	89.79	89.79	89.79	89.79	89.79	89.79	89.79	89.79	89.79	79.79
1930	104.79	103.79	103.79	103.79	103.79	103.79	103.79	103.79	103.79	103.79	103.79	93.25
1929	109.79	109.79	109.79	109.79	109.79	109.79	109.79	109.79	109.79	109.79	109.79	104.79
1928	104.79	104.79	104.79	104.79	108.19	109.79	109.79	109.79	109.79	109.79	109.79	109.79
1927	104.79	104.79	104.79	104.79	98.54	94.79	94.79	94.79	94.79	94.79	94.79	103.42
1926	119.79	119.79	102.29	92.79	92.79	92.79	92.79	92.79	92.79	99.79	104.79	104.79
1925	116.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79	119.79
1924	113.79	112.29	112.29	112.29	112.29	112.79	110.79	98.79	97.79	104.79	107.29	109.79
1923	109.79	112.29	120.79	124.79	129.79	129.79	122.29	122.29	114.79	112.79	113.79	113.79
1922	61.90	65.32	67.82	69.07	72.32	72.82	72.29	72.29	†80.59	105.47	104.92	104.92
1921	101.00	96.85	89.00	87.50	83.00	76.50	75.00	70.75	64.75	61.65	60.00	60.00
1920	146.00	160.00	172.00	200.00	200.00	198.00	190.00	193.75	172.40	156.40	153.00	120.00
1919	*212.50	165.00	134.00	113.75	110.00	111.75	111.00	110.00	105.00	110.00	110.00	121.00
1918	250.00	250.00	250.00	250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*236.00
1917	175.00	192.50	212.50	250.00	375.00	400.00	400.00	387.50	380.00	300.00	247.50	242.50
**1916	139.88	215.13	334.75	412.50	347.75	244.88	198.75	173.18	167.67	160.00	155.00	162.50
1915	68.00	78.80	95.00	95.00	97.00	105.00	103.57	101.36	110.00	109.64	100.42	103.04
1914	43.57	39.01	39.02	38.68	38.16	38.00	37.54	102.08	93.45	70.80	67.85	68.00

*Prices from May, 1918, to January, 1919, inclusive, were based on 70 per cent ferromanganese. All other prices in above table were based on 80 per cent metal.

†Duty of 1⅜ cents per pound contained manganese became effective on ferromanganese Sept. 21, 1922.

**Quotations seaboard to January, 1917; delivered Pittsburgh thereafter.

Pig Iron

Per Gross Ton

Bessemer, Delivered, Pittsburgh, 1895-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932	$17.26	$16.96	$16.76	$16.76	$16.13	$15.95	$15.76	$15.76	$15.76	$15.76	$15.76	$15.76
1931	18.76	18.51	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.16	17.76	17.51
1930	20.76	20.76	20.76	20.76	20.76	20.76	20.46	20.26	20.13	19.36	18.63	18.76
1929	19.96	19.86	20.11	20.26	20.56	20.76	20.76	20.76	20.76	20.76	20.76	20.76
1928	19.26	19.26	19.21	19.26	19.26	18.76	18.76	18.76	18.86	19.11	19.96	20.01
1927	21.26	20.76	21.16	21.26	20.86	20.66	20.26	20.26	19.86	19.76	19.76	19.26
1926	22.76	22.76	22.76	21.56	21.01	20.76	20.46	19.76	19.96	20.86	22.01	11.25
1925	24.66	24.66	23.96	26.76	21.66	20.76	20.76	20.76	21.06	21.56	22.66	22.76
1924	24.66	25.01	24.86	24.61	24.06	23.26	21.66	21.76	21.76	21.76	22.11	23.26
1923	29.27	29.57	31.67	32.77	32.07	30.27	28.52	28.07	28.27	27.27	25.47	24.27
1922	21.51	21.31	21.21	22.46	26.46	26.96	26.76	29.16	35.27	35.12	27.77	30.33
1921	33.96	30.96	28.96	27.46	26.06	25.06	22.96	21.96	22.46	22.06	21.96	21.96
1920	40.00	43.15	43.40	43.50	43.90	44.25	46.80	49.50	50.45	50.17	42.33	36.96
1919	33.60	33.60	32.55	29.35	29.35	29.35	29.35	29.35	29.35	29.35	32.00	36.65
1918	37.25	37.25	37.25	36.15	36.15	36.40	36.60	36.60	36.60	36.60	36.60	36.60
1917	35.95	35.95	37.45	42.20	44.95	55.20	57.95	55.55	48.27	37.25	37.25	37.25
1916	21.32	21.45	21.55	21.95	21.95	21.95	21.95	21.95	22.20	24.33	30.35	35.95
1915	14.70	14.63	14.55	14.55	14.55	14.58	14.88	15.89	16.80	16.95	17.45	19.70
1914	15.00	15.09	15.15	14.90	14.90	14.90	14.90	14.90	14.90	14.85	14.70	14.70
1913	18.15	18.15	18.15	17.90	17.90	17.26	16.65	16.52	16.65	16.60	16.09	15.90
1912	15.15	15.00	15.02	15.15	15.15	15.15	15.15	15.43	15.93	17.75	18.05	18.15
1911	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.39	15.10	15.15
1910	19.90	19.42	18.90	18.15	17.09	16.73	16.40	16.21	15.90	15.90	15.90	15.90
1909	17.34	16.78	16.34	15.80	15.48	16.13	16.37	17.13	18.33	19.68	19.80	19.90
1908	19.00	17.90	17.86	17.49	16.92	16.90	16.73	16.11	15.90	15.48	16.74	17.40
1907	22.92	22.78	22.85	22.16	24.10	24.10	23.30	22.90	22.90	22.80	20.60	19.90
1906	17.32	17.29	17.26	17.25	17.24	17.38	17.57	17.96	18.44	20.06	21.96	22.75
1905	16.85	16.45	16.35	16.30	16.20	15.65	15.00	15.40	15.90	16.50	17.70	18.10
1904	13.60	13.35	13.85	14.10	13.60	12.60	12.50	12.65	12.75	13.35	15.25	16.60
1903	22.35	22.35	22.00	21.60	20.00	19.85	19.00	17.85	16.35	15.85	15.25	14.35
1902	16.70	16.93	17.56	18.37	20.95	21.25	22.00	21.75	21.75	21.95	22.25	22.12
1901	13.25	13.60	16.56	16.69	16.65	15.94	16.00	15.90	15.71	15.90	16.10	16.35
1900	24.90	24.90	24.90	24.90	24.90	19.75	18.00	16.05	14.00	13.25	13.65	13.55
1899	11.00	11.75	14.00	15.15	16.25	19.00	20.75	22.00	23.50	24.00	24.50	25.00
1898	9.90	10.15	10.40	10.50	10.50	10.40	10.35	10.40	10.40	10.30	10.20	10.65
1897	10.50	10.65	10.50	10.00	9.35	9.35	9.00	9.05	10.00	10.25	10.25	9.90
1896	12.30	12.80	12.00	13.15	12.75	12.40	12.20	11.45	11.25	11.50	12.30	11.40
1895	10.00	10.15	10.25	10.75	11.25	12.00	14.00	14.75	17.25	15.75	14.00	12.25

Malleable, f.o.b. Valley, 1913-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$16.00	$15.50	$15.50	$15.50	$15.00	$14.50	$14.50	$14.50	$14.50	$14.50	$14.50	$14.50
1931	17.50	17.25	17.00	17.00	17.00	17.00	17.00	17.00	17.00	16.90	16.50	16.00
1930	19.00	19.00	19.00	19.00	19.00	19.00	18.70	18.50	18.35	17.80	17.50	17.50
1929	18.00	18.00	18.10	18.50	18.80	19.00	19.00	19.00	19.00	19.00	19.00	19.00
1928	17.25	17.25	17.25	17.25	17.25	17.00	17.00	17.00	17.10	17.35	17.90	18.00
1927	18.50	18.10	18.40	18.50	18.50	18.25	17.50	17.50	17.50	17.50	17.50	17.25
1926	20.50	20.50	20.50	19.30	19.00	18.00	17.80	17.50	17.70	18.35	19.75	19.00
1925	22.75	22.25	21.25	20.10	19.00	18.50	18.50	18.50	18.80	19.35	20.35	20.50
1924	22.00	23.00	22.50	22.20	21.30	19.75	19.00	19.00	19.50	19.50	19.75	20.50
1923	27.25	27.25	29.20	31.00	30.20	28.25	25.50	24.70	24.60	23.25	20.40	22.00
1922	19.45	19.00	19.00	20.40	24.60	24.50	25.00	28.60	34.00	32.30	29.25	26.25
1921	32.25	28.75	26.40	24.90	23.75	22.60	20.40	20.00	20.40	20.20	20.00	20.00
1920	38.95	41.60	42.35	41.60	41.60	41.85	43.40	48.25	50.50	48.25	40.40	36.00
1919	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27.25	27.75	31.75	36.40
1918	33.50	33.50	34.45	34.45	34.45	34.65	34.90	34.90	34.90	34.50	34.50	34.50
1917	31.00	33.50	36.00	39.00	42.70	40.10	53.00	54.00	49.60	34.25	33.50	33.50
1916	19.00	18.65	18.50	18.50	18.50	18.50	18.50	18.50	18.55	20.15	25.85	30.75
1915	12.75	12.75	12.85	12.50	12.50	12.50	12.65	13.75	14.50	14.60	15.50	17.90
1914	13.15	13.19	14.15	13.25	13.25	13.00	13.00	13.00	13.00	12.90	12.75	12.75
1913	17.25	17.20	16.75	15.75	14.85	14.40	14.15	14.00	14.05	14.25	13.85	13.50

Basic, Valley, 1902-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov	Dec.
1932	$15.00	$15.00	$15.00	$15.00	$15.00	$14.50	$14.00	$14.00	$14.00	$14.00	$14.00	$14.00
1931	17.00	16.75	16.75	17.00	17.00	17.00	17.00	17.00	17.00	16.60	15.00	15.00
1930	18.50	18.50	18.50	18.50	18.50	18.50	18.20	18.00	17.75	17.00	17.00	17.00
1929	17.50	17.50	17.60	18.00	18.30	18.50	18.50	18.50	18.50	18.50	18.50	18.50
1928	17.00	17.00	17.00	16.75	16.20	15.80	15.95	16.00	16.10	16.85	17.70	17.50
1927	18.50	17.85	18.50	19.00	18.10	17.90	17.50	17.50	17.15	17.00	17.00	17.00
1926	20.00	19.50	21.00	19.80	19.25	19.00	18.70	18.00	18.20	19.10	19.25	19.75
1925	21.90	22.00	21.40	20.20	19.90	18.20	18.00	18.00	18.30	18.80	19.90	20.00
1924	21.40	22.00	21.70	21.70	20.70	20.00	19.00	19.00	19.00	19.00	19.25	20.50
1923	25.90	26.10	29.80	31.00	29.80	27.35	25.15	25.00	25.00	23.75	20.80	21.00
1922	18.30	17.95	17.95	20.20	24.65	25.00	25.00	27.40	32.90	30.50	28.10	25.20
1921	29.35	26.95	24.80	23.95	22.05	21.35	19.00	19.00	19.70	19.30	19.10	18.05
1920	38.20	42.25	43.00	43.00	43.25	43.65	45.75	48.50	48.50	45.25	34.90	33.00
1919	30.00	30.00	28.95	25.75	25.75	25.75	25.75	25.75	25.75	25.75	30.15	34.20
1918	33.00	33.00	33.00	32.00	32.00	32.00	32.00	32.00	32.00	33.00	33.00	33.00
1917	30.00	30.00	32.55	38.00	41.90	49.15	52.85	49.40	41.35	33.00	33.00	33.00
1916	17.85	18.00	18.25	18.00	18.15	18.00	18.00	18.00	18.65	20.30	27.25	30.00
1915	12.50	12.50	12.50	12.50	12.65	12.70	12.95	14.35	15.00	15.00	15.50	17.50
1914	12.35	13.05	13.05	13.00	13.00	13.00	13.00	13.00	13.00	12.85	12.50	12.50
1913	16.45	16.30	16.05	15.70	14.90	14.50	14.20	14.05	14.15	13.70	13.00	12.50
1912	12.40	12.25	12.75	13.00	13.00	13.20	13.50	14.00	15.15	16.20	16.20	16.45
1911	13.30	13.60	13.75	13.75	13.40	13.05	13.00	13.00	12.70	12.50	12.30	12.45
1910	16.90	16.30	16.00	15.95	15.05	14.70	14.50	14.00	13.85	13.15	13.35	13.45
1909	15.50	15.20	14.95	14.15	14.15	14.95	15.00	15.25	15.90	16.95	17.50	17.00
1908	17.10	17.00	16.00	16.00	14.85	15.25	14.50	14.60	14.25	14.25	14.95	15.50
1907	22.00	22.00	21.00	21.00	23.00	22.25	21.95	21.45	20.10	19.70	18.75	18.00
1906	17.00	16.70	17.00	17.15	17.25	17.50	17.25	17.75	18.40	19.30	21.00	23.00
1905	15.25	15.25	15.50	15.00	15.00	14.35	14.25	14.50	14.70	15.00	16.75	16.50
1904	12.85	12.50	12.90	13.10	12.50	11.65	11.35	11.75	11.65	12.05	13.95	19.65
1903	20.95	21.25	21.10	20.60	19.35	19.15	18.55	15.35	16.00	15.10	14.15	13.10
1902	19.75	16.15	16.50	17.50	15.75	20.65	20.60	20.60	20.65	20.70	20.90	20.90

No. 2 Foundry, f.o.b. Chicago, 1895-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec
1932	$16.50	$16.50	$16.50	$16.00	$15.60	$16.00	$15.50	$15.50	$15.50	$15.50	$15.50	$15.50
1931	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.20	17.00	16.60
1930	20.00	20.00	19.50	19.40	19.00	18.40	17.90	17.50	17.50	17.50	17.50	17.50
1929	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
1928	18.50	18.50	18.50	18.50	18.20	18.00	17.60	17.60	18.25	18.80	20.00	20.00
1927	20.90	20.25	20.00	20.00	20.00	20.00	20.00	19.50	19.50	18.75	18.50	18.50
1926	23.00	23.00	23.00	22.00	21.65	21.10	21.00	21.00	21.00	21.00	21.00	21.00
1925	23.80	24.00	24.00	22.60	21.25	20.25	20.30	20.50	21.10	21.60	22.75	23.00
1924	23.70	24.40	24.50	24.40	22.80	21.40	19.80	20.40	20.50	20.50	21.00	22.00
1023	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.00
1921	32.75	28.65	25.80	24.25	23.00	21.10	19.15	19.60	21.75	21.50	21.00	20.00
1920	40.00	42.25	43.00	43.00	43.00	43.00	44.40	46.00	46.00	46.00	42.40	36.50
1919	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	31.75	31.75	38.30
1918	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917	30.00	31.25	35.70	39.25	43.20	51.00	55.00	55.00	49.50	33.00	33.00	33.00
1916	18.50	18.50	18.70	19.00	19.00	19.00	19.00	19.00	18.65	19.15	25.00	29.25
1915	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	13.80	14.45	17.10	18.00
1914	14.25	14.20	14.25	14.25	14.25	14.20	14.00	14.00	13.65	13.30	13.00	13.00
1913	18.00	18.00	17.60	17.25	16.70	16.10	15.20	15.00	15.00	15.00	15.00	14.50
1912	14.00	14.00	14.00	14.25	14.50	14.50	14.60	15.30	16.35	17.30	17.85	18.00
1911	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.50	14.50	14.50	14.00	14.00
1910	19.00	18.75	18.25	17.00	16.75	16.50	16.50	16.50	16.50	16.00	16.00	16.00
1909	17.45	16.75	16.50	16.45	16.20	16.40	16.90	17.35	18.20	18.85	19.00	19.00
1908	18.25	17.85	17.40	17.20	17.00	17.30	17.00	17.00	16.75	16.50	16.75	17.35
1907	26.00	26.50	26.75	27.50	27.40	26.50	25.40	24.50	23.60	22.60	20.60	19.00
1906	19.25	19.25	19.00	18.75	18.50	18.10	18.30	18.90	19.75	21.50	26.50	27.00
1905	17.50	17.50	17.50	17.50	17.25	16.60	16.15	16.35	16.50	17.55	18.90	19.50
1904	14.10	13.75	13.55	14.00	13.80	13.40	13.30	13.35	13.40	13.70	15.60	16.60
1903	25.00	24.00	24.00	23.00	21.70	20.50	18.50	17.50	16.85	15.90	14.50	14.30
1902	15.80	16.75	18.60	19.75	21.75	22.50	23.40	24.65	27.15	27.15	26.90	25.40
1901	14.60	14.10	15.20	15.50	15.50	15.50	15.50	15.20	15.00	15.00	15.00	15.50
1900	24.50	24.50	23.75	23.25	22.00	20.25	17.75	15.50	14.50	14.00	14.25	14.60
1899	11.25	12.00	14.25	15.00	15.25	17.00	17.00	20.00	22.00	23.00	23.50	24.50
1898	10.50	10.50	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
1897	11.00	10.75	10.75	10.75	10.25	10.00	10.00	10.00	10.25	10.75	10.75	10.50
1896	13.50	12.25	12.00	12.00	11.75	11.25	11.25	11.20	10.80	10.75	11.10	11.25
1895	9.75	9.75	9.75	10.00	10.25	10.75	12.50	13.50	13.50	14.50	14.50	14.00

Market History—

Malleable, f.o.b. Chicago, 1913-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932.....	$16.50	$16.50	$16.50	$16.00	$15.60	$16.00	$15.50	$15.50	$15.50	$15.50	$15.50	$15.50
1931.....	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.10	17.00	16.60
1930.....	20.00	20.00	19.50	19.40	19.00	18.40	17.90	17.50	17.50	17.50	17.50	17.00
1929.....	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
1928.....	18.50	18.50	18.50	18.50	18.20	18.00	17.60	17.60	18.25	18.80	20.00	20.00
1927.....	20.90	20.25	20.00	20.00	20.00	20.00	20.00	19.50	19.50	18.75	18.50	18.50
1926.....	23.00	23.00	23.00	22.00	21.65	21.10	21.00	21.00	21.00	21.00	21.00	21.00
1925.....	24.00	24.00	24.00	22.70	21.25	20.25	20.50	20.50	21.10	21.60	22.75	23.00
1924.....	23.70	24.40	24.50	24.40	22.80	21.40	19.80	20.40	20.50	20.50	21.00	22.00
1923.....	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922.....	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.25
1921.....	33.25	29.00	26.25	24.75	23.50	21.20	19.15	19.40	21.75	21.20	21.00	20.00
1920.....	40.50	42.75	43.50	43.50	43.50	43.50	44.90	46.50	46.60	46.50	43.00	37.50
1919.....	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27.25	28.00	32.25	38.80
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	34.50	34.50	34.50
1917.....	30.00	31.25	35.80	39.00	43.20	50.50	55.00	55.00	49.50	33.35	33.50	33.50
1916.....	19.00	19.00	19.00	19.50	19.50	19.50	19.50	19.50	19.15	19.50	25.00	29.25
1915.....	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	14.20	15.10	17.40	18.00
1914.....	14.25	14.25	14.25	14.25	14.25	14.25	14.00	14.00	13.50	13.50	13.00	13.00
1913.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.40

No. 2X Foundry, Delivered, Philadelphia, 1910-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932.....	$15.76	$15.76	$15.76	$15.66	$15.13	$14.76	$14.76	$14.51	$14.26	$14.16	$13.95	$13.88
1931.....	18.26	18.26	18.26	18.26	17.76	17.76	17.76	17.51	17.01	16.01	16.01	15.76
1930.....	21.56	21.26	20.76	20.76	20.26	20.26	20.26	19.76	19.76	19.26	19.13	18.26
1929.....	22.26	22.01	22.26	22.26	22.76	22.76	22.76	22.26	22.26	22.26	22.26	21.76
1928.....	20.51	20.91	21.26	21.26	21.26	21.26	20.76	20.76	21.01	21.76	21.51	21.76
1927.....	22.76	22.26	22.26	22.26	22.26	22.01	21.51	21.26	21.01	20.66	20.51	20.26
1926.....	24.26	24.01	23.26	23.26	23.01	22.76	22.26	22.01	22.26	22.51	23.51	23.76
1925.....	25.61	25.26	24.51	23.16	21.76	21.51	21.26	21.76	21.86	22.61	24.01	24.26
1924.....	24.26	24.26	24.13	23.73	22.60	21.76	21.76	21.76	21.26	21.36	22.98	24.88
1923.....	29.56	30.10	32.00	32.75	32.75	30.60	28.00	25.80	26.20	24.50	23.00	24.26
1922.....	21.55	21.35	23.60	23.75	25.60	27.20	27.90	32.15	34.25	33.00	30.50	28.45
1921.....	35.00	31.00	27.40	26.25	26.10	26.00	23.50	21.00	21.40	22.00	22.50	22.10
1920.....	43.90	45.00	45.68	46.80	46.90	46.90	48.55	50.95	53.75	52.65	46.75	38.95
1919.....	36.15	36.15	35.10	31.00	30.10	29.60	29.50	29.60	29.95	32.00	35.85	40.75
1918.....	34.25	34.25	34.25	34.25	34.25	34.25	34.50	34.50	34.50	38.85	39.15	39.15
1917.....	30.50	31.75	36.90	41.75	43.35	47.50	54.35	53.40	47.80	34.00	34.00	34.00
1916.....	19.75	20.00	20.00	20.75	20.50	19.75	19.75	19.75	19.75	20.50	25.25	30.00
1915.....	14.25	14.25	14.25	14.25	14.00	14.25	14.50	15.25	16.25	16.50	17.50	19.25
1914.....	14.75	15.00	15.00	15.00	14.75	14.75	14.75	14.75	14.75	14.50	14.25	14.25
1913.....	18.25	18.00	17.75	17.50	17.00	16.25	15.50	15.75	16.00	15.75	15.50	15.00
1912.....	15.00	15.00	15.00	15.25	15.25	15.50	15.75	16.00	16.50	17.50	18.00	18.25
1911.....	15.50	15.50	15.75	15.50	15.25	15.00	15.00	15.00	15.00	15.00	14.85	14.75
1910.....	19.00	18.40	18.25	17.75	17.25	16.75	16.00	16.00	16.00	15.75	15.50	15.50

Basic, Delivered Eastern Pennsylvania, 1909-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932.....	$16.00	$15.75	$15.75	$15.00	$15.00	$14.50	$14.35	$13.90	$13.75	$13.60	$13.50	$13.50
1931.....	17.25	17.25	17.25	17.25	17.00	17.00	16.75	16.75	16.00	16.00	16.00	16.00
1930.....	19.20	19.00	18.80	18.76	18.75	18.75	18.00	18.00	17.87	17.50	17.50	17.50
1929.....	20.15	20.50	20.25	20.25	20.50	20.25	19.85	19.85	19.85	19.75	19.75	19.75
1928.....	19.50	19.50	19.50	19.25	19.10	19.10	19.00	19.00	19.00	19.75	19.75	19.75
1927.....	21.25	21.00	21.00	20.90	20.75	20.75	20.50	19.75	19.75	19.50	19.50	19.25
1926.....	22.75	22.50	22.20	21.76	21.76	21.76	21.00	21.00	20.76	21.00	22.50	22.75
1925.....	24.25	24.20	24.05	22.65	21.45	21.50	21.50	20.55	20.50	20.50	22.70	23.00
1924.....	22.50	22.50	21.50	21.35	20.75	20.60	20.50	20.00	20.00	20.00	21.46	22.50
1923.....	27.70	28.15	29.35	30.75	30.75	28.15	27.25	25.10	25.10	24.00	22.60	23.30
1922.....	20.25	19.85	19.90	21.70	24.55	25.25	26.00	29.50	30.00	30.25	28.00	27.65
1921.....	33.35	29.95	26.20	25.00	25.00	24.70	22.25	20.70	19.50	20.50	20.90	20.25
1920.....	39.75	40.50	43.00	43.70	44.00	44.05	44.10	47.45	51.15	50.75	44.55	34.75
1919.....	33.90	33.90	32.85	29.65	28.80	25.50	26.60	27.00	27.00	27.90	33.00	35.75
1918.....	33.90	33.90	33.90	32.90	32.90	32.90	32.90	32.90	32.90	36.60	36.90	36.90
1917.....	30.15	30.50	33.80	38.25	40.80	46.40	50.75	51.00	46.50	33.50	33.50	33.50
1916.....	19.50	19.50	20.00	20.50	20.00	19.25	19.00	19.25	20.00	21.00	25.50	30.50
1915.....	13.50	13.75	14.00	13.25	13.50	13.50	13.75	15.25	17.25	17.50	17.75	18.00
1914.....	14.00	14.25	14.25	14.25	14.00	14.00	14.00	14.00	14.00	14.00	13.50	13.50
1913.....	18.25	18.00	17.50	16.50	16.50	16.00	15.25	15.00	15.25	15.25	15.00	14.25
1912.....	14.25	14.25	14.25	15.00	15.00	15.25	15.50	16.25	16.50	17.50	18.00	18.25
1911.....	14.50	15.00	15.25	15.25	14.75	14.50	14.50	14.50	14.50	14.50	14.25	14.25
1910.....	18.75	18.50	18.00	17.50	16.25	15.75	15.50	15.00	15.00	14.50	14.50	14.50
1909.....	16.40	16.10	15.85	15.05	15.00	15.85	15.90	16.15	16.80	17.85	18.36	18.15

Southern Ohio No. 2, f.o.b. Ironton, 1913-1929

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1929.....	$18.50	$18.50	(Production discontinued in this district).									
1928.....	19.00	19.00	$19.00	$19.00	$19.00	$19.00	$19.00	$19.00	$19.00	$18.60	$18.20	$18.50
1927.....	19.90	20.00	20.00	20.00	20.00	19.80	19.00	19.00	19.00	19.00	19.00	19.00
1926.....	21.40	20.60	21.00	20.40	20.00	19.50	19.50	19.90	20.00	20.00	20.00	20.00
1925.....	22.00	22.00	21.60	21.00	19.50	18.75	19.00	19.35	19.50	19.60	21.00	21.00
1924.....	22.90	24.00	23.50	23.00	22.50	20.25	19.50	19.75	20.00	20.00	20.90	22.00
1923.....	27.90	28.40	30.75	31.00	31.00	28.25	26.50	26.00	24.90	23.90	22.50	22,50
1922.....	19.60	19.15	19.00	20.30	22.70	23.25	24.15	27.00	33.75	32.40	29.25	27.00
1921.....	34.60	30.00	27.50	25.85	24.50	22.80	20.50	20.15	20.30	21.00	20.50	20.00
1920.....	39.50	43.00	43.25	43.25	44.00	44.00	44.00	46.50	46.80	46.00	44.00	37.25
1919.....	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	28.80	31.75	36.55
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	30.00	30.75	35.80	37.75	41.20	47.50	54.50	55.00	49.25	33.00	33.00	33.00
1916.....	18.30	18.50	18.30	18.50	18.50	18.15	18.45	18.40	18.15	19.40	24.00	30.00
1915.....	12.75	12.75	12.75	12.75	12.56	12.50	12.60	13.65	14.20	14.90	16.15	17.00
1914.....	13.00	13.00	13.25	13.50	13.50	13.50	13.00	13.50	13.00	13.00	12.65	12.65
1913.....	17.90	17.50	17.20	16.85	16.20	15.90	15.40	15.20	15.20	14.75	14.70	13.50

Market History—

No. 2 Foundry, f.o.b. Valley, 1904-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932	$15.50	$15.50	$15.00	$15.00	$14.80	$14.50	$14.50	$14.50	$14.50	$14.50	$14.50	$14.50
1931	17.00	16.75	16.90	17.00	17.00	17.00	17.00	17.00	17.00	16.85	16.00	15.50
1930	18.50	18.50	18.50	18.50	18.50	17.63	18.00	18.00	17.75	17.20	17.00	17.00
1929	17.50	17.50	17.75	18.15	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
1928	17.25	17.25	17.25	17.25	17.10	16.75	16.50	16.50	16.85	17.00	17.70	18.00
1927	18.43	18.06	18.37	18.50	18.50	18.20	17.50	17.50	17.50	17.50	17.45	17.25
1926	20.50	20.50	20.50	19.30	19.00	18.00	17.80	17.50	17.70	18.35	19.60	19.00
1925	22.25	22.00	21.25	20.20	18.85	18.50	18.50	18.75	19.20	20.40	00.00	20.50
1924	22.40	23.00	22.50	21.75	20.90	19.50	19.00	19.25	19.50	19.50	19.60	20.50
1923	27.00	27.00	29.60	31 00	30.15	27.75	25.60	24.70	24.75	23.40	22.00	22.00
1922	20.05	19.20	19.20	20 55	23.95	24.20	24.20	31.00	35.25	31.85	28.40	25.00
1921	31.10	28.20	26.20	25.05	23.80	22.50	20.30	20.10	21.20	21.20	20.05	20.35
1920	40.90	42.40	43.40	44.20	45.40	45.40	46.40	49.65	50.95	48.95	42.95	37.20
1919	31.00	31.00	29.10	26.75	26.75	28.15	28.15	28.15	29.50	34.95	35.35	38.15
1918	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917	32.35	34.25	37.20	39.99	42.95	51.40	55.90	54.70	49.05	33.00	33.00	33.00
1916	18.90	18.75	18.75	18.90	18.70	18.50	18.50	18.50	18.65	20.75	26.10	31.30
1915	13.25	13.25	13.25	12.95	12.75	12.75	12.85	13.95	14.75	14.85	15.90	17.50
1914	12.89	13.25	13.40	13.50	13.50	13.50	13.50	13.30	13.25	13.10	12.90	13.05
1913	17.50	17.30	16.75	15.80	14.80	14.15	13.85	13.80	14.00	13.90	13.90	13.50
1912	13.00	13.10	13.20	13.35	13.30	13.30	13.50	13.85	14.50	16.15	17.30	17.50
1911	18.75	13.75	13.85	13.85	14.75	13.60	13.50	13.50	13.50	13.50	13.15	12.80
1910	17.00	16.55	16.10	15.75	15.35	14.65	14.20	14.10	14.40	13.95	13.75	13.75
1909	15.35	15.00	14.85	14.25	14.35	14.85	15.25	15.35	16.25	17.10	17.25	17.25
1908	16.35	16.00	15.70	15.10	14.50	15.35	15.10	15.00	14.60	14.20	15.50	15.50
1907	23.30	24.00	24.00	24.00	24.50	24.50	23.15	22.55	21.30	20.05	19.15	17.05
1906	17.55	17.25	17.15	16.75	16.65	16.25	16.50	18.00	19.00	20.50	23.00	23.75
1905	16.50	16.15	16.00	16.15	15.75	14.35	14.35	14.55	14.75	15.65	16.85	17.25
1904	12.50	12.25	13.00	12.90	12.15	11.65	11.50	11.65	11.75	12.40	15.00	16.00

Southern No. 2, f.o.b. Birmingham, 1904-1932

(Local delivery)

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932	$12.00	$11.20	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00
1931	14.00	13.00	13.00	13.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
1930	14.70	15.00	14.50	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
1929	16.50	16.50	16.00	15.50	15.50	15.25	14.00	14.00	14.00	14.00	14.00	14.00
1928	16.00	16.00	16.00	16.00	16.00	15.90	15.50	15.65	16.25	16.25	16.30	16.50
1927	18.50	18.00	18.00	18.00	18.00	18.00	17.43	17.25	17.25	17.25	16.00	16.00
1926	22.75	22.00	22.00	22.00	22.00	21.00	21.00	21.00	20.80	20.00	20.00	20.00
1925	20.10	20.75	21.00	20.00	20.00	19.00	18.00	18.00	18.50	19.50	21.00	21.20
1924	21.60	23.00	23.00	22.20	21.60	20.00	18.20	17.90	17.65	17.50	17.90	19.50
1923	23.30	24.50	26.50	27.00	27.00	26.75	25.00	23.60	22.75	20.20	19.25	21.00
1922	16.15	19.25	15.25	16.00	17.60	18.50	18.50	20.70	26.25	27.40	24.00	22.50
1921	33.75	27.70	25.10	23.00	22.50	21.70	20 25	19.00	19.00	19.00	18.25	17.00
1920	38.20	40.00	40.00	40.00	42.00	42.30	42.30	42.00	42.00	42.00	39.50	38.00
1919	31.00	31.00	30.00	26.75	26.25	25.25	25.00	26.75	26.75	27.45	30.65	35.15
1918	33.50	33.50	33.50	33.50	33.50	33.50	33 50	33.50	33.50	35.25	35.25	35.25
1917	23.00	24.50	28.00	35.80	35.75	35.75	46.00	48.00	43.50	33.50	33.50	33.50
1916	14.50	14.65	15.00	15.00	15.00	14.45	14.00	13.60	14.40	15.15	19.60	23.00
1915	9.50	9.50	9.40	9.35	9.75	9.55	9.60	11.00	11.30	11.75	13.15	14.20
1914	10.50	10.50	10.60	10.50	10.50	10.45	10.05	10.00	10.00	10.00	9.90	9.50
1913	13.70	13.50	13.00	12.50	11.75	10.60	10.50	11.00	11.00	11.00	10.75	11.00
1912	10.00	10.00	10.05	10.50	10.95	11.00	11.25	11.65	12.50	13.45	13.75	13.50
1911	11.00	11.00	11.00	11.00	10.75	10.25	10.00	10.05	10.10	10.00	9.75	10.00
1910	14.00	13.90	13.00	12.10	11.80	11.60	11.40	11.00	11.00	11.00	11.00	11.00
1909	13.00	12.70	11.75	11.00	11.00	11.30	12.30	13.00	14.00	14.50	14.50	14.00
1908	12.80	12.50	12.10	11.90	11.50	12.00	11.60	12.05	12.50	12.50	12.50	13.00
1907	23.00	23.00	22.75	22.00	21.40	21.25	20.50	19.80	18.10	17.65	16.00	14.90
1906	14.00	14.00	13.70	13.65	13.75	13.50	13.00	14.15	16.00	17.15	21.25	22.00
1905	13.50	13.50	13.50	13.25	12.75	11.85	11.00	11.65	11.75	12.50	14.00	14.00
1904	9.75	9.50	9.70	10.00	9.65	9.15	9.15	9.50	9.50	10.65	12.75	13.05

Lake Superior Charcoal, Delivered, Chicago, 1907-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932	$22.29	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04	$23.04
1931	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	25.54	25.04	25.04	20.79
1930	27.04	27.04	27.04	27.04	27.04	24.04	27.04	27.04	27.04	27.04	27.04	27.04
1929	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04
1928	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04
1927	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04
1926	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	27.04	27.04	27.04
1925	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04
1924	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04	29.04
1923	33.15	33.53	35.53	36.55	36.55	36.65	36.62	32.10	32.04	30.04	28.65	29.04
1922	31.50	30.50	26.90	26.50	28.40	30.00	31.65	33.75	36.15	36.15	36.15	36.15
1921	40.25	38.50	38.50	38.50	38.50	38.50	36.87	34.30	33.25	32.50	32.25	31.50
1920	48.75	55.65	57.50	57.50	57.50	57.50	57.50	57.60	58.30	58.50	58.50	53.50
1919	38.70	38.70	38.70	33.25	31.75	31.75	31.75	32.75	32.75	33.15	35.50	41.00
1918	37.50	37.50	37.50	37.50	37.50	37.50	37.70	37.70	37.70	37.70	38.70	38.70
1917	33.75	34.50	37.55	42.25	49.25	51.80	59.50	59.50	59.50	48.50	37.50	37.50
1916	19.25	19.50	19.75	19.75	19.75	19.75	19.75	19.75	19.75	20.35	21.95	31.75
1915	15.75	15.75	15.75	15.75	15.25	15.25	15.75	15.75	15.95	16.25	17.50	19.25
1914	15.50	15.50	15.50	15.50	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75
1913	18.25	18.00	18.00	18.00	18.00	16.75	16.75	15.00	15.00	15.75	15.50	15.50
1912	16.50	16.50	16.50	15.50	15.75	15.75	16.25	16.75	17.75	18.75	18.75	18.75
1911	17.50	17.50	17.50	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	16.50
1910	19.50	19.50	19.00	19.00	19.00	18.50	18.50	18.50	18.50	18.00	18.00	17.50
1909	19.50	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70
1908	22.80	21.50	21.50	21.10	19.85	19.50	19.50	19.50	19.50	19.50	19.50	19.50
1907	25.50	26.75	25.50	26.00	27.10	27.40	27.10	27.00	26.75	26.10	25.25	23.50

Market History—

Standard Low Phosphorus, Del. Eastern Pennsylvania, 1911-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76	$23.76
1931	24.76	24.76	24.76	24.76	24.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76
1930	24.76	24.76	24.76	24.76	24.76	24.26	24.26	24.26	24.76	24.76	24.76	24.76
1929	24.26	24.26	24.26	24.26	24.26	24.26	24.26	24.26	24.76	24.76	24.76	24.76
1928	24.76	24.76	24.76	24.76	24.76	24.51	24.51	24.51	24.26	24.26	24.26	24.26
1927	25.76	25.76	25.76	25.76	25.76	25.76	25.76	25.26	25.26	25.26	24.76	24.76
1926	24.76	24.76	24.76	24.76	24.76	24.26	24.26	24.26	24.51	24.76	25.76	25.76
1925	26.76	26.76	26.76	26.26	25.26	25.26	25.26	25.26	24.01	24.51	24.76	24.76
1924	27.76	27.76	26.76	27.86	27.26	27.26	27.26	26.26	26.26	26.26	26.76	29.79
1923	29.75	31.35	35.45	35.45	35.80	34.80	33.80	32.80	30.50	30.50	30.00	29 76
1922	35.00	34.00	34.00	34.00	35.35	35.35	35.15	38.00	40.00	40.00	40.00	40.00
1921	47.70	46.80	46.80	44.15	43.30	43.30	43.30	43.30	43.30	43.30	43.30	35.30
1920	51.60	53.55	53.80	53.80	54.80	60.20	57.80	59.60	65.30	65.30	*65.30	*65.30
1919	51.00	51.00	49.90	46.75	45.80	42.25	41.10	40.25	40.25	40.35	43.00	47.50
1918	55.50	55.50	55.50	55.50	55.50	55.50	56.00	56.00	56.00	57.00	57 00	57.00
1917	54.50	57.50	66.70	75.50	77.00	85.00	92.50	92.50	82.00	55.50	55 50	55.50
1916	32.00	32.00	32.00	33.00	34.00	34.00	33.00	33.00	34.00	40.00	46.00	55.00
1915	19.00	19.00	20.00	20.00	20.00	20.50	21.50	23.50	24.50	28.00	30.00	32.00
1914	21.00	21.00	21.00	21.00	21.00	20.50	20.50	21.00	21.00	21.00	19.00	19.00
1913	24.50	24.50	24.00	23.50	23.50	23.50	23.50	23.00	23.00	23.00	21.50	21.00
1912	19.25	19.00	19.00	19.50	19.75	19.75	20.00	21.00	21.50	22.50	24.00	24.50
1911	21.50	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.25	19.50	19.25

*Nominal.

No. 2X, f.o.b. Virginia Furnace, 1911-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00	$18.00	$17.75	$17.75	$17.75	$17.75	$17.75
1931	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.00	18.00	18.00
1930	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25	18.25
1929	21.25	21.25	21.00	20.75	20.75	20.00	20.00	20.00	20.00	19.65	18.25	18.25
1928	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	21.25
1927	21.75	22.00	22.00	22.00	22.00	22.00	22.00	21.50	21.50	21.50	21.25	21.00
1926	23.50	23.25	23.25	23.25	23.00	23.00	22.75	22.75	23.00	22.50	22.75	23.00
1925	24.50	24.50	24.50	23.90	23.35	23.00	23.00	23.00	23.00	23.00	23.00	23.30
1924	25.00	25.75	26.00	25.50	25.50	25.50	24.50	24.50	24.50	24.50	24.50	25.00
1923	27.50	27.50	28.25	29.25	28.60	28.00	27.25	26.25	25.50	25.00	25.00	24.50
1922	21.75	22.00	22.50	22.85	23.50	24.50	26.00	26.00	33.00	33.00	31.40	27.75
1921	34.50	31.25	28.05	27.10	27.00	26.00	24.50	24.00	23.00	23.25	22.80	22.50
1920	41.25	42.75	43.25	44.25	45.75	46.25	46.75	49.25	50.25	49.75	45.75	42.05
1919	35.25	33.00	31.55	28.45	27.50	26.50	26.50	28.25	29.25	30.35	33.40	38.25
1918	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	37.50	38.00	38.00
1917	26.50	28.25	34.25	38.30	41.00	46.50	52.25	51.90	46.50	33.50	33.50	33.50
1916	17.25	18.00	18.25	18.50	18.50	18.50	18.50	18.50	17.50	18.50	23.75	27.00
1915	12.50	12.50	12.50	12.50	12.50	12.50	12.50	13.00	13.50	14.00	15.50	17.00
1914	12.75	12.75	12.75	12.75	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
1913	16.00	15.50	15.50	15.00	14.50	13.75	13.00	13.00	13.00	13.00	13.00	12.75
1912	12.25	12.25	12.25	13.00	13.00	13.25	13.50	14.00	14.50	15.50	16.00	16.00
1911	12.75	12.75	13.00	13.00	13.00	12.25	12.25	12.25	12.25	12.25	12.25	12.25

No. 2X Foundry, f.o.b. Buffalo, 1913-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50	$16.50
1931	18.00	18.00	18.00	18.00	17.60	17.50	17.50	17.50	17.50	17.50	17.50	17.50
1930	19.40	19.00	19.00	19.00	19.00	19.00	19.00	18.75	19.00	18.40	18.00	18.00
1929	19.00	19.00	19.25	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
1928	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	18.00	19.00	19.00
1927	19.75	18.90	18.15	18.00	18.00	17.90	17.50	17.45	18.00	18.00	17.60	17.50
1926	21.50	21.50	21.50	21.50	21.25	20.50	19.80	20.00	20.00	20.00	20.00	20.00
1925	23.50	22.75	22.50	20.90	19.25	19.00	19.00	19.00	19.00	19.50	21.25	21.50
1924	23.10	22.75	22.00	21.50	20.50	19.90	19.30	19.10	19.50	19.60	20.90	22.00
1923	28.00	28.50	29.40	30.10	29.80	29.50	26.60	25.50	25.25	23.00	20.70	22.00
1922	19.80	19.15	18.30	20.75	23.00	23.85	25.35	31.50	33.75	31.50	27.85	26.00
1921	33.75	31.25	28.25	26.75	26.25	23.85	21.75	21.25	21.05	20.40	20.00	20.00
1920	41.50	44.60	45.15	46.25	46.25	46.25	46.25	48.75	51.25	51.25	46.00	48.25
1919	32.25	32.25	31.45	28.00	28.00	28.00	28.00	28.70	28.75	29.90	34.45	39.50
1918	33.50	33 50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	35.25	35.25	35.25
1917	35.00	35.00	38.15	40.00	42.75	49.15	53.50	54.00	49.05	33.50	33.50	33.50
1916	18.50	18.60	18.85	19.15	19.00	18.75	18.75	18.75	18.90	20.70	26.65	33.65
1915	13.15	13.05	12.55	12.75	12.75	12.75	12.80	13.70	15.15	15.80	16.70	18.00
1914	13.00	13.00	13.75	13.90	13.50	13.05	13.05	13.20	13.25	12.60	12.45	13.10
1913	17.25	17.00	17.00	16.50	15.50	14.75	14.00	14.00	14.25	14.00	14.00	14.00

Semifinished Material

Per Gross Ton f.o.b.

Wire Rods, Pittsburgh, 1912-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00
1931	35.00	35.00	36.00	36.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1930	40.00	40.00	38.00	38.00	36.40	36.00	36.00	36.00	36.00	36.00	36.00	35.50
1929	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	40.00	40.00
1928	41.50	43.50	44.00	44.00	44.00	44.00	42.00	42.00	42.00	42.00	42.00	42.00
1927	45.00	43.50	43.00	42.50	42.00	42.00	43.00	43.00	43.00	42.50	41.00	40.00
1926	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
1925	48.00	48.00	48.00	47.75	46.00	45.25	45.00	45.00	45.00	45.00	45.00	45.30
1924	51.00	51.00	51.00	51.00	48.40	48.00	48.00	46.00	45.75	45.00	45.50	48.00
1923	45.00	47.50	47.00	46.60	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1922	37.00	35.75	35.80	38.00	38.00	38.00	39.50	40.00	45.00	45.00	46.50	46.50
1921	57.00	57.00	52.00	50.00	48.00	47.00	42.25	42.00	40.80	40.00	38.00	38.00
1920	52.00	56.00	62.50	70.00	70.00	70.00	70.00	70.00	70.00	75.00	72.50	57.00
1919	57.00	57.00	55.75	52.00	52.00	52.00	52.00	52.00	52.00	52.00	56.00	62.00
1918	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.25	57.50	57.50	57.50
1917	73.75	75.00	75.00	83.75	88.00	92.50	95.00	96.00	90.00	73.50	57.00	57.00
1916	46.25	50.00	51.00	55.00	60.00	60.00	58.75	55.00	55.00	55.00	64.00	69.00
1915	25.00	25.00	25.00	25.00	25.00	25.00	25.60	26.75	28.50	30.00	34.50	39.00
1914	25.50	25.90	26.00	26.00	26.00	25.50	24.80	24.50	25.60	26.00	25.75	25.05
1913	30.00	30.00	30.00	30.00	30.00	29.50	28.60	27.60	27.50	26.80	26.00	25.70
1912	24.65	25.30	25.50	25.50	25.90	25.35	25.65	26.00	26.25	27.80	29.60	30.00

Market History—

Bessemer Billets, Pittsburgh, 1895-1932

	Jan.	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$27.50	$27.00	$27.00	$27.00	$27.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00
1931	30.00	30.00	30.00	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
1930	33.80	33.00	33.00	33.00	32.20	31.25	31.00	31.00	31.00	31.00	31.00	30.50
1929	33.00	34.25	34.00	34.50	36.00	35.75	35.00	35.00	35.00	35.00	35.00	34.75
1928	33.00	33.00	33.00	33.00	33.00	32.50	32.25	32.00	32.00	32.75	33.00	33.00
1927	35.00	34.00	33.60	33.50	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00
1926	35.50	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1925	37.40	37.60	37.75	35.80	35.35	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1924	40.00	40.00	40.00	40.00	39.20	38.00	38.00	38.00	37.10	36.60	35.50	35.50
1923	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	39.00	29.00
1920	49.60	61.25	65.00	68.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38.50	39.30	40.85	45.00
1918	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917	62.50	64.85	69.30	75.20	88.65	95.60	102.25	92.25	74.05	58.75	47.50	47.50
1916	34.05	35.50	41.10	46.25	46.10	43.00	42.50	45.15	47.50	48.10	53.10	59.50
1915	19.75	20.00	20.00	20.00	20.05	20.35	21.45	23.00	24.70	25.20	27.10	30.75
1914	20.00	20.90	21.05	21.05	20.00	19.80	19.55	20.05	21.00	20.40	19.25	18.85
1913	28.90	28.90	29.00	29.00	27.80	26.75	26.75	26.30	25.00	23.00	21.10	20.10
1912	20.00	20.00	19.90	20.00	21.10	21.90	22.25	22.40	23.75	25.70	26.75	27.00
1911	23.00	23.00	23.00	23.00	23.00	21.00	21.00	21.00	21.00	20.00	19.70	19.25
1910	27.87	27.50	27.50	27.00	26.10	25.50	25.00	25.00	24.50	23.40	23.00	23.00
1909	25.00	23.50	23.00	22.00	22.50	23.00	24.00	25.00	26.00	26.50	27.50	27.50
1908	28.00	28.00	28.00	28.00	28.00	26.50	25.00	25.00	25.00	25.00	25.00	25.00
1907	29.75	29.50	29.25	29.75	30.25	31.00	30.00	30.00	29.50	28.50	28.00	28.00
1906	27.00	27.50	27.65	27.75	27.00	26.25	27.00	28.00	28.50	28.50	29.00	29.75
1905	21.00	24.90	24.60	25.50	23.50	22.00	22.00	23.50	25.75	25.95	26.30	26.50
1904	23.00	23.00	23.00	23.00	22.00	21.50	21.00	20.00	19.50	19.50	21.00	21.00
1903	29.75	30.00	30.25	31.00	30.50	29.50	27.50	27.00	27.00	26.50	23.50	23.00
1902	28.05	29.80	31.35	32.25	33.90	35.20	33.50	32.10	31.50	29.80	29.00	29.25
1901	19.70	19.75	20.80	24.10	24.20	24.45	24.25	24.40	24.10	26.80	28.25	27.60
1900	35.00	35.00	35.00	34.50	29.00	27.25	22.50	18.00	17.50	17.50	19.30	19.75
1899	16.75	18.25	24.00	25.50	27.00	31.50	33.50	36.50	39.00	37.50	36.00	35.00
1898	15.00	15.00	15.25	15.25	14.85	14.75	14.75	15.45	16.10	15.75	15.25	16.00
1897	15.25	15.50	15.50	14.75	14.00	14.25	14.00	14.15	15.75	16.50	15.75	15.00
1896	17.05	17.65	17.50	18.90	19.50	19.75	19.90	91.75	19.60	20.25	20.00	17.00
1895	14.85	15.00	14.85	15.40	16.75	18.75	20.85	22.00	24.25	22.00	19.50	17.00

Open-Hearth Billets, Pittsburgh, 1910-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$27.50	$27.00	$27.00	$27.00	$27.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00
1931	30.00	30.00	30.00	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
1930	33.80	33.00	33.00	33.00	32.20	31.25	31.00	31.00	31.00	31.00	31.00	30.50
1929	33.00	34.25	34.00	34.50	36.00	35.75	35.00	35.00	35.00	35.00	35.00	34.75
1928	33.00	33.00	33.00	33.00	33.00	32.50	32.25	32.00	32.00	32.75	33.00	33.00
1927	35.00	34.00	33.60	33.50	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00
1926	35.50	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
1925	37.75	37.65	37.75	35.80	35.40	33.90	35.00	35.00	35.00	35.00	35.00	35.00
1924	40.00	40.00	40.00	40.00	39.20	38.00	38.00	38.00	37.10	36.60	35.50	35.50
1923	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	29.00	29.00
1920	49.60	61.25	66.25	70.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38.50	39.30	40.85	45.00
1918	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917	60.00	62.50	67.00	72.50	85.00	93.75	100.00	93.00	73.75	58.75	47.50	47.50
1916	34.75	35.00	40.60	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	58.75
1915	19.50	19.50	19.50	19.50	19.50	19.85	21.50	24.00	25.60	26.50	28.00	30.20
1914	20.00	20.75	21.00	20.80	20.00	19.75	19.30	20.00	21.00	20.60	19.00	18.50
1913	28.70	29.40	29.50	29.50	28.10	26.50	26.50	26.10	25.00	23.00	20.85	20.00
1912	19.75	19.50	19.40	20.25	21.00	21.25	21.75	21.75	21.75	21.75	21.75	28.00
1911	23.00	23.00	23.00	23.00	22.00	21.00	21.00	21.00	20.25	19.50	19.75	19.25
1910	28.00	28.00	28.50	28.75	28.75	27.00	26.50	26.00	25.00	24.00	23.25	23.00

Bessemer Sheet Bars, Pittsburgh, 1913-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$27.50	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00
1931	30.00	30.00	30.00	30.00	29.75	29.00	29.00	29.00	29.00	29.00	29.00	28.50
1930	33.80	33.00	33.00	33.00	32.20	31.25	31.00	31.00	31.00	31.00	31.00	30.50
1929	34.00	33.25	35.00	35.25	36.00	35.75	35.00	35.00	35.00	35.00	35.00	34.75
1928	34.00	34.00	33.70	34.00	34.00	33.50	32.25	32.20	33.00	33.00	33.60	34.00
1927	36.00	35.00	34.00	33.75	33.75	33.50	33.50	33.50	33.90	34.00	34.00	34.00
1926	36.50	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
1925	39.20	39.00	38.50	37.00	36.25	35.00	35.00	35.00	35.00	35.00	35.00	36.80
1924	42.50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
1923	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920	53.40	65.00	70.00	70.00	75.00	70.00	70.00	70.00	68.50	63.75	56.25	47.65
1919	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00
1917	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	57.00
1916	33.75	34.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914	21.00	22.00	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913	28.70	29.40	29.50	29.50	28.40	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Open-Hearth Sheet Bars, Pittsburgh, 1913-1932

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1932	$27.50	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00
1931	30.00	30.00	30.00	30.00	29.75	29.00	29.00	29.00	29.00	29.00	29.00	28.50
1930	33.80	33.00	33.00	33.00	32.20	31.25	31.00	31.00	31.00	31.00	31.00	30.50
1929	34.00	33.25	35.00	35.25	36.00	35.75	35.00	35.00	35.00	35.00	35.00	34.75
1928	34.00	34.00	33.70	34.00	34.00	33.50	32.25	32.20	33.00	33.00	33.60	34.00
1927	36.00	35.00	34.00	33.75	33.75	33.50	33.50	33.50	33.90	34.00	34.00	34.00
1926	36.50	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
1925	39.25	39.00	38.25	37.00	36.25	35.00	35.00	35.00	35.00	35.00	35.00	36.80
1924	42.50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
1923	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920	53.40	65.00	72.50	78.00	78.75	75.00	75.00	71.25	68.50	63.75	56.25	47.65
1919	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1917	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	51.00
1916	34.75	35.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914	20.60	21.75	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913	29.20	29.90	30.00	30.00	28.80	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Beehive Coke

Per Net Ton

Furnace, Spot, Connellsville, 1914-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$2.25	$2.25	$2.25	$2.25	$2.15	$2.00	$2.00	$2.00	$2.00	$2.00	$1.80	$1.80
1931	2.50	2.50	2.50	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.35	2.30
1930	3.55	2.60	2.60	2.60	2.55	2.50	2.50	2.50	2.60	2.60	2.55	2.50
1929	2.75	2.90	2.95	2.75	2.75	2.75	2.75	2.75	2.65	2.65	2.65	2.65
1928	2.70	2.65	2.60	2.60	2.55	2.60	2.60	2.75	2.75	2.80	2.75	2.75
1927	3.35	3.35	3.30	3.20	2.80	2.85	2.90	3.00	2.85	2.85	2.80	2.65
1926	6.90	7.45	3.15	3.05	2.85	2.70	2.65	2.85	3.25	3.65	4.75	3.65
1925	4.10	3.65	3.35	3.10	3.10	2.80	2.80	3.10	3.45	5.65	6.35	3.90
1924	3.80	4.00	4.05	3.55	3.25	3.15	2.85	3.00	3.00	3.00	3.00	3.35
1923	8.25	7.20	7.15	6.25	5.10	4.65	4.35	4.45	4.55	3.85	3.80	4.20
1922	2.75	2.95	3.25	4.30	6.00	6.60	10.65	13.20	11.00	10.60	7.10	6.25
1921	5.15	4.85	4.55	3.60	3.25	3.15	2.75	2.85	3.15	3.25	3.15	2.95
1920	6.00	6.00	6.00	11.20	12.00	14.50	15.20	17.75	16.90	15.15	8.40	6.25
1919	5.85	4.40	4.30	4.05	3.95	4.10	4.25	4.60	4.95	4.35	5.75	6.20
1918	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1917	9.05	11.20	9.40	7.60	8.35	11.40	12.10	13.70	12.10	6.00	6.00	6.00
1916	2.50	3.00	3.00	2.25	2.25	2.55	2.70	2.75	2.95	5.30	7.05	8.25
1915	1.60	1.55	1.50	1.50	1.55	1.55	1.70	1.50	1.60	1.70	2.10	2.10
1914	1.80	1.80	1.95	1.90	1.75	1.75	1.75	1.75	1.65	1.65	1.60	1.60

Foundry, Spot, Connellsville, 1900-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$3.25	$3.25	$3.25	$3.25	$3.15	$3.00	$3.00	$2.90	$2.75	$2.75	$2.65	$2.50
1931	3.30	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1930	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1929	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.55	3.50
1928	3.75	3.75	3.75	3.65	3.55	3.50	3.50	3.75	3.75	3.75	3.75	3.75
1927	4.25	3.85	4.15	4.05	3.80	3.90	4.00	4.00	4.00	3.75	3.75	3.65
1926	6.40	6.50	4.45	4.10	3.85	3.75	3.70	3.60	4.15	4.65	5.85	4.75
1925	5.10	4.30	3.85	3.85	3.70	3.75	3.75	3.80	4.20	5.95	6.85	5.30
1924	4.35	4.80	4.85	4.60	4.30	4.15	4.05	4.00	4.00	4.00	4.05	4.25
1923	9.00	8.60	8.15	7.80	6.10	5.50	5.15	5.20	5.70	4.80	4.85	5.15
1922	3.85	3.80	4.05	4.95	6.50	7.20	11.40	14.30	12.75	12.10	8.40	7.50
1921	6.50	6.30	6.05	5.00	4.85	4.50	4.45	4.00	4.30	4.50	4.30	4.15
1920	7.00	7.00	7.00	11.60	12.50	15.00	16.00	18.25	17.90	16.85	9.40	7.25
1919	7.05	5.15	4.80	4.55	4.35	4.70	4.80	5.20	5.90	5.60	6.95	7.15
1918	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1917	10.40	10.90	11.30	9.65	9.65	11.20	15.00	12.70	13.35	7.00	7.00	7.00
1916	3.75	3.75	3.60	3.85	3.10	3.00	3.00	3.05	3.25	4.35	8.60	9.25
1915	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.25	2.30	2.95	3.15
1914	2.50	2.40	2.40	2.40	2.40	2.35	2.30	2.25	2.25	2.20	2.10	2.00
1913	4.45	3.70	3.50	3.05	2.90	2.85	2.85	2.85	2.85	2.75	2.50	2.50
1912	2.05	2.20	2.65	2.75	2.60	2.55	2.45	2.60	2.65	3.35	4.40	4.50
1911	1.95	1.95	2.00	2.00	1.90	1.75	1.80	1.85	1.85	1.85	1.90	1.90
1910	3.00	2.90	2.80	2.55	2.30	2.15	2.10	2.15	2.10	2.05	2.00	2.00
1909	1.70	1.60	1.55	1.50	1.45	1.50	1.50	1.65	2.30	2.75	2.80	2.75
1908	1.80	1.75	1.70	1.65	1.65	1.65	1.65	1.65	1.65	1.70	1.75	1.80
1907	3.75	3.55	3.00	2.70	2.15	2.05	2.40	2.60	2.80	2.90	2.40	2.00
1906	3.00	2.40	2.35	2.60	2.55	2.40	2.55	2.70	2.75	2.85	3.20	3.60
1905	2.80	2.50	2.50	2.00	1.90	1.85	1.80	1.85	2.00	2.70	3.00	2.85
1904	1.45	1.50	1.55	1.50	1.45	1.40	1.40	1.40	1.40	1.45	1.85	2.15
1903	4.50	4.50	4.00	3.75	3.50	3.00	2.50	2.00	2.00	1.90	1.90	1.75
1902	2.25	2.25	2.50	2.50	2.50	2.50	2.50	3.25	4.00	5.00	5.00	5.00
1901	1.75	1.75	2.00	2.00	2.00	1.85	1.75	1.75	1.75	2.00	2.00	2.00
1900	3.00	3.50	4.00	3.75	3.00	2.50	2.00	1.75	1.75	1.75	1.75	1.75

By-Product Foundry Coke

Per Net Ton

Chicago, Ovens, 1921-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$7.50	$7.50	$7.50	$7.50	$7.30	$7.00	$7.00	$7.00	$7.00	$7.00	$7.00	$7.00
1931	8.00	8.00	8.00	8.00	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
1930	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
1929	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
1928	9.00	9.00	9.00	9.00	9.00	8.50	8.00	8.00	8.00	8.00	8.00	8.00
1927	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.30	9.00
1926	10.50	10.50	10.50	9.95	9.75	9.75	9.75	9.75	9.75	9.75	9.75	10.25
1925	10.75	10.75	10.75	10.75	10.75	10.75	9.75	9.75	9.75	10.25	10.45	10.50
1924	12.50	12.50	12.50	12.50	12.50	12.50	11.45	10.75	10.75	10.75	10.75	10.75
1923	15.00	15.00	15.00	15.00	15.00	15.00	13.50	13.50	13.50	13.50	12.50	12.50
1922	11.25	11.25	11.25	11.25	11.25	11.25	11.25	12.60	13.50	13.50	14.70	15.00
1921	.....	.....	.....	.....	.....	.....	11.25	11.25	11.25	11.25	11.25	11.25

Birmingham, Ovens, 1925-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.25	$4.50	$4.50	$4.50	$4.15	$4.00
1931	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.75
1930	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1929	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1928	5.00	5.00	5.00	3.95	4.80	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1927	5.15	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.25	5.00
1926	5.60	5.50	5.50	5.15	5.15	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1925	.....	4.90	5.00	5.00	4.65	4.50	4.50	4.50	4.60	4.75	5.70	5.70

Newark, Delivered, 1921-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1932	$8.76	$8.76	$8.76	$8.76	$8.23	$8.21	$8.21	$8.21	$8.21	$8.21	$8.21	$8.21
1931	9.00	9.00	9.00	9.00	9.00	8.70	8.70	8.70	8.70	8.70	8.70	8.70
1930	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1929	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1928	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1927	9.84	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59
1926	11.01	11.01	11.01	9.59	9.59	9.59	9.59	9.59	9.59	9.59	10.59	10.59
1925	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.71	11.04	11.52
1924	10.91	10.91	10.91	10.81	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41
1923	12.84	12.84	12.84	12.84	12.34	11.84	11.34	11.34	11.34	11.41	10.91	10.91
1922	8.59	8.59	8.59	8.84	9.49	10.34	11.47	14.04	14.84	14.84	13.28	12.84
1921	.....	.....	.....	.....	.....	.....	8.84	8.84	8.84	8.84	8.84	8.84

St. Louis, Delivered, 1921-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$8.50	$8.50	$8.50	$8.50	$8.50	$7.95	$7.75	$7.75	$7.75	$7.75	$7.75	$7.75
1931	9.00	9.00	9.00	9.00	9.00	8.60	8.50	8.50	8.50	8.50	8.50	8.50
1930	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1929	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1928	9.75	9.75	9.75	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
1927	10.50	10.50	10.50	*9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75
1926	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.25	10.50
1925	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.15	9.50	9.80	10.00	10.00
1924	12.50	12.50	12.50	12.00	12.00	10.60	9.20	9.00	9.00	9.00	9.00	9.00
1923	14.00	14.25	14.20	14.00	14.00	14.00	14.00	13.00	13.00	13.00	13.00	13.00
1922	9.50	9.50	9.30	9.00	9.00	9.00	9.00	11.40	13.00	14.00	14.00	14.00
1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.50

*Granite City previous to April, 1927.

New England, Delivered, 1921-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$10.50	$10.50	$10.50	$10.50	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00
1931	11.00	11.00	11.00	11.00	11.00	10.50	10.50	10.50	10.50	10.50	10.50	10.50
1930	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
1929	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
1928	11.50	11.50	11.50	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
1927	13.50	12.65	12.50	12.50	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
1926	13.00	13.00	13.00	12.50	12.50	12.00	12.00	12.00	12.00	12.00	13.00	13.50
1925	11.50	12.00	12.00	12.00	12.00	11.50	11.50	11.65	12.00	12.00	12.90	13.00
1924	12.50	12.50	12.50	12.00	12.00	11.30	*11.80	11.50	11.50	11.50	11.50	11.50
1923	16.00	16.00	16.00	16.00	16.00	15.50	13.50	13.50	13.50	13.50	12.50	12.50
1922	10.40	10.25	10.15	10.15	10.15	10.15	14.00	16.30	16.50	16.50	16.20	16.00
1921	.....	.....	.....	.....	.....	.....	.....	.....	10.66	10.66	10.66	10.66

*Prior to this, Boston delivered.

Iron and Steel Scrap

Per Gross Ton Delivered

No. 1 Cast, Pittsburgh, 1917-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$10.00	$9.80	$9.50	$9.50	$9.20	$9.00	$8.60	$8.50	$9.50	$9.50	$9.25	$9.00
1931	12.50	12.50	12.50	12.20	11.50	10.85	10.00	10.00	10.00	10.00	10.00	10.00
1930	14.70	14.50	14.50	15.00	14.50	14.00	14.00	14.00	14.00	13.40	12.40	12.50
1929	15.30	14.50	15.20	15.45	15.00	15.00	15.00	15.00	15.00	15.00	14.90	14.50
1928	14.50	14.50	14.50	14.75	14.60	14.00	14.00	14.05	14.25	14.55	15.10	14.70
1927	16.00	15.60	15.60	16.00	15.75	15.10	15.00	15.00	15.00	14.70	14.50	14.50
1926	17.40	16.86	17.00	17.00	16.25	15.85	15.60	16.85	16.40	16.10	16.00	16.00
1925	19.50	18.85	18.35	17.80	17.00	17.00	17.00	17.10	17.50	17.40	17.75	17.50
1924	21.30	20.85	19.60	18.35	17.50	17.75	17.70	18.00	18.35	17.70	18.25	18.50
1923	22.65	24.50	27.70	27.75	25.60	23.75	21.50	21.20	21.50	19.35	18.50	20.00
1922	16.00	16.00	16.40	17.25	18.50	18.70	19.15	19.00	21.75	23.35	23.30	22.50
1921	24.50	22.00	21.00	18.25	17.50	16.00	15.00	14.85	16.30	17.50	17.10	16.25
1920	32.50	41.50	41.00	39.60	39.00	40.00	38.50	41.50	42.20	40.75	38.00	27.50
1919	25.60	21.00	21.00	21.75	21.00	21.00	21.00	24.00	24.50	25.00	28.75	30.50
1918	28.00	28.00	28.00	34.00	32.50	32.50	32.50	32.50	32.50	32.50	32.40	32.00
1917	20.00	19.75	21.50	23.35	24.60	33.25	34.75	35.00	32.50	28.00	28.90	28.50

No. 1 Cast, Eastern Pennsylvania, 1915-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$11.20	$10.00	$10.00	$9.50	$9.25	$9.00	$9.00	$9.25	$9.25	$9.00	$9.00	$9.00
1931	12.80	13.00	13.00	13.00	12.75	12.50	12.50	12.50	12.50	12.50	11.70	11.50
1930	16.00	15.75	15.75	15.50	15.00	14.75	13.50	13.50	13.50	13.50	13.50	12.50
1929	16.75	16.75	16.50	16.50	16.50	16.50	16.50	16.50	16.25	16.25	16.00	16.00
1928	16.75	16.75	16.75	16.25	16.25	16.00	16.00	15.75	16.20	17.00	16.50	16.50
1927	17.75	17.50	17.50	17.25	17.25	16.75	16.35	16.25	16.25	16.25	16.75	16.75
1926	18.35	18.25	18.25	18.25	18.00	17.75	17.80	18.25	18.15	17.75	17.75	17.75
1925	20.75	19.35	18.50	18.20	17.10	17.75	17.75	17.75	18.65	18.75	18.75	18.75
1924	20.75	20.35	19.25	18.35	17.10	17.90	17.80	18.00	18.40	17.95	18.25	19.50
1923	23.30	24.75	28.00	26.85	24.80	22.75	21.00	20.00	20.35	19.70	19.50	20.50
1922	16.75	16.50	17.00	17.40	17.90	18.50	18.00	18.00	20.65	23.00	21.90	20.50
1921	24.15	23.35	20.50	18.15	17.90	17.50	17.50	16.50	16.50	17.50	18.00	17.50
1920	36.50	38.55	40.00	38.00	38.00	37.00	37.20	38.75	39.80	38.00	34.75	28.90
1919	28.15	25.00	22.50	22.50	21.50	22.00	23.50	24.65	25.00	25.15	28.00	31.75
1918	33.50	34.50	33.90	32.75	33.00	33.75	34.00	34.00	34.00	34.00	34.00	34.00
1917	20.75	20.15	22.50	26.75	30.00	34.75	38.35	34.10	32.90	30.00	30.50	32.00
1916	17.50	17.50	17.75	18.00	17.75	16.50	16.00	16.00	16.25	16.50	18.50	22.00
1915	12.00	12.00	12.50	12.50	12.00	12.25	12.25	13.50	14.50	14.50	15.00	15.60

No. 1 Cast, Chicago, 1918-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$8.90	$8.90	$8.40	$7.85	$7.00	$6.40	$6.15	$6.45	$7.30	$7.30	$6.85	$6.70
1931	10.65	10.65	10.65	10.25	9.80	9.80	9.80	9.80	9.80	9.80	9.00	8.95
1930	15.10	15.25	15.70	15.60	14.80	14.25	13.45	13.45	13.45	12.90	10.95	10.65
1929	17.70	17.90	17.90	17.90	17.25	16.25	16.25	16.25	16.80	15.65	15.35	15.10
1928	15.75	15.75	15.65	15.65	15.90	15.95	15.95	15.95	16.30	16.55	16.90	17.35
1927	18.90	18.90	18.50	18.10	17.35	16.65	16.55	16.80	16.80	16.25	15.85	15.70
1926	19.40	18.75	18.75	18.65	18.05	18.15	19.55	19.00	18.95	17.90	18.35	18.50
1925	22.10	20.15	19.70	18.85	19.00	19.50	19.75	20.30	20.15	19.40	20.90	20.50
1924	22.10	22.25	20.80	20.00	19.00	17.75	18.60	19.00	20.25	19.20	19.25	20.75
1923	24.30	25.75	28.50	27.55	24.20	23.25	23.25	21.20	21.50	20.40	20.55	21.50
1922	14.00	14.50	15.10	16.15	17.40	17.30	17.65	19.70	23.80	24.00	22.90	22.00
1921	20.35	21.15	18.10	15.25	15.85	14.90	13.75	13.95	14.50	15.25	15.50	14.00
1920	42.50	43.25	42.20	44.10	42.50	41.75	41.20	42.00	39.30	32.75	27.65	22.10
1919	26.25	22.05	23.10	23.50	22.35	23.40	20.65	27.75	26.75	28.15	31.10	35.35
1918	30.00	30.00	33.00	32.45	30.75	31.00	31.80	33.40	34.00	34.00	32.75	29.00

Market History—

Low Phosphorus Scrap, Pittsburgh, 1917-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$13.90	$13.00	$13.15	$13.85	$13.00	$12.00	$10.60	$10.50	$10.50	$10.60	$10.75	$10.50
1931	17.20	17.50	17.50	17.20	16.25	14.75	13.50	13.50	14.00	14.00	14.00	14.00
1930	21.50	21.75	21.85	21.60	20.50	19.50	19.00	19.35	20.00	19.30	17.60	17.50
1929	22.00	22.50	22.35	23.25	22.40	22.25	22.50	22.80	23.00	22.20	21.75	20.50
1928	18.85	18.50	18.20	18.35	18.50	18.50	18.50	19.00	20.00	20.75	21.00	21.00
1927	20.25	19.50	20.00	20.50	19.10	19.10	19.00	19.00	20.00	19.50	18.60	18.50
1926	24.00	22.00	21.50	20.90	19.50	19.75	20.30	21.75	21.60	20.25	20.40	20.30
1925	26.20	25.35	23.85	21.60	21.75	22.40	22.50	22.50	23.00	23.40	24.00	24.00
1924	23.90	24.25	23.75	20.60	19.30	21.40	21.70	22.00	22.25	22.30	23.50	25.00
1923	25.15	27.00	31.30	32.10	28.30	25.00	23.15	22.70	23.50	22.50	20.70	22.50
1922	17.50	17.10	17.10	18.60	20.00	20.60	21.00	20.60	22.90	24.85	25.00	24.50
1921	24.50	22.00	21.20	18.25	18.00	17.00	15.25	15.50	16.30	18.00	17.65	17.25
1920	31.50	33.00	32.60	30.60	30.00	30.75	30.00	33.15	34.00	33.75	31.00	25.50
1919	29.40	24.25	22.50	22.40	22.00	21.25	23.00	24.00	24.00	24.00	25.75	27.50
1918	42.20	40.00	40.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	38.60	38.50
1917	32.00	30.00	33.00	34.25	36.60	43.50	52.75	43.00	47.25	43.50	39.00	39.00

Iron Car Wheels, Chicago, 1915-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$7.75	$7.00	$7.00	$6.75	$6.35	$6.00	$5.50	$6.15	$7.00	$7.00	$7.10	$7.00
1931	11.25	10.75	10.60	9.50	9.25	10.20	10.00	9.90	9.50	9.50	9.00	8.75
1930	14.05	14.20	14.50	14.45	13.80	13.50	13.50	13.50	13.50	13.10	12.00	11.50
1929	14.10	14.50	14.50	14.75	14.50	14.20	13.60	14.00	14.00	14.00	13.60	13.65
1928	13.70	14.25	13.95	13.50	13.45	13.10	13.00	13.00	13.00	13.10	14.05	14.05
1927	14.95	15.10	15.00	14.85	14.00	13.50	13.80	14.75	14.25	13.50	13.15	13.40
1926	18.00	16.30	16.70	16.45	15.65	15.40	16.50	16.50	15.75	14.50	14.50	14.60
1925	21.00	19.65	17.50	16.85	15.90	17.40	17.15	17.50	17.60	17.25	18.15	18.40
1924	20.60	21.25	19.90	17.50	16.60	15.65	16.40	16.90	18.40	17.90	18.60	19.50
1923	25.35	26.50	28.50	27.65	24.30	21.50	20.90	19.60	19.60	18.60	17.85	19.00
1922	15.25	14.65	15 90	18.15	18.80	18.25	18.90	20.40	23.50	24.75	24.60	23.75
1921	21.50	21.40	16.60	14.45	14.50	13.70	12.75	13.70	14.90	16.15	16.25	15.90
1920	36.25	38.75	36.15	38.50	38.25	36.00	35.70	38.40	38.80	37.25	33.25	25.80
1919	23.20	21.15	20.00	20.40	20.20	22.00	24.50	25.15	23.50	23.60	28.50	29.75
1918	30.40	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	27.50
1917	19.75	18.30	20.30	23.25	27.20	37.00	36.75	30.70	31.00	25.90	27.50	29.50
1916	14.75	14.05	14.05	14.00	13.15	12.50	11.90	12.00	12.25	12.25	15.95	21.00
1915	10.00	10.00	10.00	10.00	9.75	9.85	10.30	11.40	11.75	11.75	12.75	14.75

Heavy Melting Steel, Pittsburgh, 1902-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$10.25	$10.25	$10.25	$10.20	$9.75	$9.00	$8.35	$8.55	$9.50	$9.50	$9.15	$8.75
1931	13.00	12.75	12.90	12.50	11.25	10.30	10.50	10.70	10.80	10.45	10.25	10.25
1930	16.55	16.90	16.60	16.05	15.40	15.10	14.90	15.20	15.70	14.80	12.85	12.75
1929	19.00	18.60	18.50	18.60	17.85	18.30	18.45	18.90	18.45	17.30	16.30	15.10
1928	15.35	15.05	14.75	14.85	15.00	14.70	14.10	15.00	16.55	17.35	17.35	17.50
1927	17.00	16.10	16.40	16.50	15.50	15.10	14.95	15.00	15.00	14.50	14.50	14.60
1926	18.75	17.60	17.70	16.90	16.00	15.85	16.70	17.75	17.75	17.00	17.00	17.00
1925	22.10	19.00	18.25	17.00	16.60	17.10	17.20	19.25	19.00	18.40	19.50	19.00
1924	21.10	21.60	19.75	16.60	15.40	16.25	17.30	17.75	18.60	18.20	19.85	21.00
1923	21.65	23.40	26.10	25.85	22.50	20.50	18.25	17.50	18.00	16.10	15.70	18.50
1922	14.50	13.95	14.95	16.50	17.00	17.40	16.50	17.10	19.50	21.35	20.30	20.00
1921	15.00	15.00	15.00	13.00	13.60	13.10	12.00	12.60	13.20	14.00	14.25	14.25
1920	26.50	28.15	28.00	26.40	25.50	25.30	25.70	27.75	28.60	28.00	24.00	17.20
1919	20.80	17.00	14.60	15.75	15.55	17.25	19.90	21.25	20.50	20.00	21.90	24.65
1918	30.00	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
1917	23.25	21.90	23.40	28.15	28.40	40.00	40.25	36.60	35.50	31.30	29.60	30.00
1916	17.50	17.35	17.95	18.10	17.10	16.25	16.25	16.00	16.10	17.80	20.55	26.75
1915	11.55	11.60	12.00	11.90	11.75	11.75	11.75	13.38	14.25	14.00	15.30	17.40
1914	11.30	12.15	12.40	12.25	12.00	12.00	12.00	11.65	11.65	11.40	10.40	10.45
1913	15.15	14.90	14.40	14.40	14.15	13.50	12.75	12.65	12.65	12.65	11.75	11.20
1912	12.50	12.65	12.40	13.00	13.40	13.40	13.65	13.55	13.90	14.40	15.30	15.00
1911	13.50	14.30	14.40	13.50	12.75	13.15	12.90	13.40	13.15	12.25	12.15	12.50
1910	17.90	17.65	17.00	17.00	16.00	15.25	14.50	14.25	14.25	14.40	14.15	13.75
1909	16.50	16.00	14.75	14.15	14.95	15.50	15.75	16.00	16.75	17.90	18.15	17.95
1908	13.25	13.25	13.50	12.75	12.75	13.00	13.25	14.75	14.75	14.50	14.75	16.25
1907	19.25	18.75	18.25	18.25	18.15	18.65	18.50	18.25	17.75	17.50	15.45	13.75
1906	17.75	16.65	15.90	14.65	15.25	15.00	15.75	16.00	16.90	16.75	17.25	19.75
1905	16.75	16.15	16.50	16.50	15.40	14.50	14.25	14.15	15.40	16.20	17.15	18.25
1904	12.65	13.25	13.75	14.15	13.05	11.50	10.75	11.15	11.75	12.00	13.65	14.90
1903	22.25	21.75	21.25	22.15	21.65	20.50	20.25	18.75	18.25	18.25	16.00	14.50	11.50
1902	17.25	17.45	18.55	19.40	20.25	21.40	22.25	21.25	21.25	21.65	21.15	22.25

Heavy Melting Steel, Detroit (Dealers), 1926-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1932	$5.55	$5.75	$5.75	$5.70	$5.10	$4.75	$3.90	$4.25	$5.55	$5.75	$5.30	$4.60
1931	9.50	9.50	9.15	8.65	8.15	7.40	7.55	7.30	6.80	6.15	6.00	5.80
1930	12.25	12.00	11.85	11.70	11.30	11.00	10.85	10.95	11.15	10.95	9.95	9.55
1929	14.20	14.35	14.05	14.25	13.90	13.50	13.75	14.35	14.20	13.40	12.40	12.50
1928	11.44	11.25	11.05	10.75	11.00	10.88	10.38	10.50	11.69	12.50	13.30	13.50
1927	12.50	12.50	12.70	12.88	11.88	11.50	11.56	11.75	11.70	11.50	11.38	11.25
1926	14.75	14.75	14.75	13.35	12.50	12.00	12.80	13.50	12.94	12.75	11.94	12.20

Heavy Melting Steel, Chicago, 1909-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$7.25	$6.80	$6.75	$6.55	$6.20	$5.60	$4.50	$5.40	$5.75	$6.00	$5.75	$5.50
1931	10.00	9.85	9.75	9.60	8.65	8.50	8.50	8.25	7.95	7.75	7.65	7.50
1930	12.65	13.25	13.20	13.00	12.55	12.05	12.00	12.00	12.25	11.55	10.20	10.00
1929	16.50	16.00	15.55	15.95	15.45	14.95	14.75	15.05	15.05	14.45	13.05	12.50
1928	12.25	12.55	12.75	12.75	12.95	12.60	12.30	12.65	12.90	13.75	14.50	14.50
1927	13.20	13.10	13.05	13.10	12.35	12.00	12.10	12.35	12.20	11.75	11.50	11.95
1926	14.95	13.75	14.00	13.20	12.25	12.65	14.20	14.00	14.10	13 05	13.00	12.90
1925	19.45	17.55	16.70	15.00	14.90	15.90	15.35	16.05	16.45	16.25	16.40	15.80
1924	17.40	18.00	16.70	14.65	13.75	13.55	14.75	15.40	16.40	16.25	17.05	18.50
1923	18.70	19.75	23.15	22.40	19.75	17.75	17.10	16.25	16.55	14.50	13.80	16.00
1922	11.20	11.15	12.05	13.55	14.65	14.45	15.15	15.85	18.15	18.50	17.40	16.75
1921	15.25	15.25	12.55	11.25	11.50	11.20	10.55	10.70	11.30	12.55	12.40	11.00
1920	24.25	25.05	24.20	23.95	23.15	22.40	23.70	24.15	24.20	21.40	18.50	16.75
1919	19.20	14.90	15.25	16.40	15.40	16.75	19.40	20.75	19.00	18.80	20.65	21.25
1918	29.70	30.00	30.00	28.65	28.90	29.00	29.00	29.00	290.0	29.00	29.00	26.50
1917	20.25	21.65	23.00	26.65	28.70	37.00	35.50	33.10	32.65	27.00	28.50	28.90
1916	15.50	15.25	16.20	16.75	16.50	15.35	14.15	14.90	15.50	16.50	19.35	23.35
1915	8.90	9.45	9.75	9.30	9.25	9.40	10.15	11.50	12.00	11.55	13.15	15.40
1914	9.20	10.00	9.80	9.50	9.95	9.75	9.50	9.50	9.40	9.00	8.25	8.25
1913	12.75	12.50	12.50	12.50	12.00	12.00	12.00	12.00	12.00	12.00	9.00	9.00
1912	11.00	10.75	11.25	12.25	12.25	12.25	11.75	12.50	13.00	14.00	13.75	13.75
1911	11.50	12.00	12.00	11.50	10.25	10.25	10.25	10.75	10.50	10.00	9.75	9.75
1910	16.00	15.50	14.50	14.50	13.00	13.00	12.50	12.25	12.25	12.25	12.00	12.00
1909	14.00	13.40	12.15	12.90	13.50	14.15	14.05	14.95	15.80	16.30	15.75	15.50

Heavy Melting Steel, Eastern Pennsylvania, 1909-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$7.50	$7.35	$7.35	$7.20	$6.50	$6.25	$6.25	$6.40	$7.25	$7.25	$7.25	$6.50
1931	10.50	10.50	10.50	10.00	9.50	8.75	8.25	8.55	8.75	8.20	7.95	7.50
1930	14.50	14.50	14.95	13.95	13.40	13.25	12.50	12.65	13.00	12.00	11.50	11.00
1929	16.50	16.30	16.25	17.00	16.25	16.25	16.50	16.75	16.37	15.80	15.15	14.50
1928	14.00	14.00	13.75	13.75	13.75	13.15	12.75	12.75	14.65	16.00	15.90	15.50
1927	15.60	15.00	14.75	14.75	14.45	14.25	13.75	13.75	14.00	14.00	14.00	14.00
1926	17.35	16.35	16.20	15.90	15.25	15.25	15.50	16.75	16.85	16.65	15.95	15.50
1925	20.00	17.85	16.25	15.50	15.00	15.65	16.00	16.75	17.25	17.00	17.60	17.70
1924	18.05	18.95	17.00	15.25	14.20	15.00	15.00	16.50	15.90	16.50	18.05	19.00
1923	19.70	21.20	24.85	23.50	20.40	18.65	17.25	16.00	16.85	15.50	15.50	17.00
1922	11.75	12.25	13.15	14.35	15.15	15.30	15.00	15.25	17.10	18.00	16.70	16.00
1921	15.00	14.50	13.40	11.75	11.80	11.85	11.25	11.25	11.75	12.25	12.60	12.00
1920	24.25	25.75	25.55	24.30	23.60	22.40	22.00	24.10	26.40	23.80	20.30	16.90
1919	19.00	15.25	14.25	15.85	15.30	16.15	18.85	19.60	19.00	19.55	20.80	23.90
1918	29.80	30.00	29.50	28.30	28.50	28.50	28.50	28.50	28.50	28.50	28.00	25.00
1917	21.75	20.25	23.50	25.00	26.00	32.60	37.00	32.80	30.75	26.00	26.80	28.00
1916	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915	10.00	10.50	11.00	11.25	11.50	11.50	12.00	13.50	14.50	15.00	14.50	16.00
1914	10.50	11.25	11.50	11.00	10.75	10.75	10.50	10.75	10.75	9.75	9.50	9.50
1913	14.50	13.50	13.50	13.75	12.50	12.00	11.50	11.75	12.00	11.00	10.25	10.00
1912	12.25	12.00	12.25	13.00	13.75	13.50	13.75	14.25	14.75	15.50	15.25	15.00
1911	12.75	14.25	14.25	13.75	13.25	13.00	13.00	13.25	12.75	12.00	12.25	12.50
1910	17.00	16.50	16.50	15.50	14.50	14.50	14.00	13.75	14.00	13.50	12.75	12.50
1909	17.00	15.50	13.75	13.50	14.50	15.50	16.00	17.00	17.50	18.00	18.00	17.25

Cast Borings, Pittsburgh, 1902-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$6.75	$6.50	$6.75	$6.65	$6.40	$5.50	$4.75	$5.15	$5.95	$6.25	$6.50	$5.90
1931	7.70	7.70	7.65	7.60	7.50	7.75	7.05	7.50	7.45	7.50	7.10	6.80
1930	11.10	12.00	11.15	10.75	10 50	9.88	8.50	8.50	8.90	8.40	7.75	7.15
1929	12.55	12.25	11.50	12.15	11.55	11.85	12.10	12.50	12.40	11.80	11.15	10.75
1928	11.50	11.00	10.70	10.60	10.70	10.40	9.80	10.50	12.00	12.40	12.00	12.50
1927	12.50	12.00	12.10	12.38	11.13	10.50	10.50	11.50	11.30	11.00	11.00	11 60
1926	14.75	14.25	13.25	12.60	11.75	11.85	12.20	12.75	13.00	12.60	12.50	12.00
1925	17.20	15.60	14.50	13.60	12.85	13.40	13.50	14.50	14.85	14.10	15.10	14.80
1924	16.50	16.50	15.35	13.65	12.00	13.85	13.75	14.20	14.75	15.20	16.25	17.00
1923	18.50	19.75	21.80	21.10	21.60	17.50	15.50	15.00	16.00	13.40	12.40	14.00
1922	10.40	11.25	11.85	13.00	14.15	14.80	15.75	15.75	17.30	18.15	17.75	17.50
1921	12.50	12.35	11.60	9.70	9.50	9.00	7.60	8 00	9.05	11.60	10.65	9.55
1920	19.35	21.70	20.35	19.85	19.25	18.35	18.25	19.55	20.50	19.35	17.00	14.50
1919	14.00	11.80	10.95	12.60	11.30	11.65	13.90	16 10	15.75	15.75	17.95	18.35
1918	20.00	20.00	20.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	18.00
1917	12.35	12.25	13.20	14.70	15.45	21.10	23.90	22.00	23.55	20.70	20.00	20.00
1916	11.35	11.40	11.40	11.30	10.30	9.90	8.65	8.00	8.50	9.15	9.85	13.35
1915	8.25	8.15	8.40	8.40	8.40	8.65	8.65	9.00	9.25	9.75	10.00	10.20
1914	7.90	8.40	9.25	8.40	8.40	7.90	8.15	8.50	8.50	8.25	8.25	8.25
1913	10 40	10.40	10.40	10.40	10.40	9.25	8.40	8.15	8.15	8.40	7.75	7.45
1912	9.65	9.40	9.15	9.65	10.15	10.15	10.25	10.15	9.90	9.90	10.50	10.40
1911	8.65	8.65	9.50	8.75	8.50	8.90	8.90	9.25	9.40	8.50	8.25	8.35
1910	11.00	10.75	9.75	9.75	9.25	8.75	8.00	8.25	8.40	8.40	8.50	8.65
1909	10.75	9.75	8.25	7.75	7.25	9.65	9.75	9 50	10.65	11.15	11.25	11.00
1908	6.50	7.50	8.00	8.00	7.50	7.75	7.75	8.75	8.75	8.75	9.75	11.00
1907	12.40	12.65	13.15	13.65	13.50	13.75	13.75	13.25	13.25	13.00	9.95	6.50
1906	10.90	10.15	9.65	8.15	8.90	8.75	8.75	9.00	9.75	10.25	10.75	12.25
1905	10.75	11.25	11 15	10.90	10.15	10.00	9.15	8.40	8.90	9.75	10.50	10.90
1904	6.00	5.75	5.40	6.15	7.15	5.65	5.75	5.25	6.25	6.25	7.40	8.75
1903	11.25	11.50	11.65	11.25	11.25	.....	.....	9.00	9.00	7.00	.....	5.25
1902	8.55	9.15	9.65	10.75	11.75	12.00	11.65	10.75	14.40	15.85	11.65	11.50

Rails for Rolling, Chicago, 1908-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$10.30	$9.85	$9.50	$8.90	$8.25	$7.75	$6.60	$6.50	$7.00	$8.00	$8.25	$8.00
1931	13.00	12.10	12.00	11.85	11.15	10.90	10.50	10.50	10.50	10.50	10.00	10.00
1930	14.65	14.80	15.00	15.00	14.85	14.55	14.50	14.50	14.50	14.10	13.10	13.00
1929	17.10	17.50	17.50	17.50	17.50	17.50	17.50	17.75	17.60	17.05	15.30	14.60
1928	15.00	15.00	14.45	14.00	14.35	14.85	14.50	15.00	15.80	16.40	16.50	16.50
1927	16.00	16.00	15.50	15.85	15.10	14.60	14.60	15.00	15.20	14.70	13.95	14.00
1926	17.55	16.30	16.50	16.00	14.95	15.10	17.10	17.25	17.25	16.65	16.50	16.50
1925	20.95	19.15	18.15	15.85	16.75	18.15	17.45	19.10	19.00	18.55	19.40	18.80
1924	18.90	20.00	19.30	17.10	15.30	14.55	15.50	16.00	17.40	17.20	18.20	19.50
1923	20.55	22.00	24.90	23.65	21.80	19.40	18.40	17.75	18.30	16.25	15.10	17.00
1922	12.50	11.50	12.85	14.25	15.50	15.40	16.00	16.75	19.40	20.50	18.90	18.00
1921	15.80	15.90	13.30	12.70	13.25	12.80	12.45	12.70	13.05	14.00	13.90	12.50
1920	33.60	34.65	32.60	32.50	31.50	32.35	34.90	38.00	38.50	34.00	24.15	17.40
1919	22.30	15.55	16.30	17.95	17.45	19.25	24.70	29.00	25.38	26.80	31.15	31.50
1918	35.30	35.00	35.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917	27.25	25.65	27.25	31.90	36.80	46.00	46.25	41.90	41.25	36.00	35.70	35.65
1916	17.70	17.10	17.20	17.90	17.25	16.25	15.70	15.70	16.90	18.75	24.90	29.50
1915	9.50	9.60	10.00	9.85	10.00	10.00	10.10	11.75	13.15	13.25	14.30	16.70
1914	11.00	11.20	11.25	11.25	11.25	11.25	11.25	11.25	10.85	10.00	9.50	9.50
1913	16.25	15.50	15.00	14.50	14.00	14.00	12.00	12.50	12.00	12.00	12.00	11.50
1912	13.00	13.00	12.75	12.75	13.25	13.50	13.25	13.50	14.75	16.00	16.50	16.50
1911	13.50	13.50	13.50	13.00	12.75	12.25	12.25	12.50	12.25	12.25	12.00	12.25
1910	17.75	17.75	17.50	17.50	17.25	16.50	16.50	15.50	15.75	15.75	15.00	14.00
1909	15.80	15.05	12.80	13.20	14.65	15.50	15.55	16.00	17.20	18.00	20.25	17.70
1908	12.30	13.00	12.20	12.75	13.20	14.00	14.45	15.60	16.00	15.70	16.95	17.25

No. 1 Railroad Wrought, Chicago, 1915-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$7.25	$6.85	$6.25	$5.85	$5.25	$5.00	$4.60	$4.50	$5.60	$5.60	$5.60	$5.00
1931	9.50	9.25	9.00	8.80	8.40	8.25	8.25	8.25	8.00	8.00	8.00	7.45
1930	13.40	13.70	13.50	13.30	12.70	11.50	11.25	11.25	11.25	10.95	10.20	10.00
1929	14.75	15.75	16.00	16.65	16.40	15.40	14.85	15.40	15.70	14.85	13.85	13.25
1928	12.65	12.40	12.45	12.45	13.05	12.70	12.30	12.40	12.90	13.50	14.25	14.50
1927	14.20	13.95	13.50	13.50	12.75	12.10	12.35	13.45	12.70	11.40	11.25	11.25
1926	15.00	14.40	14.50	14.05	12.55	12.65	14.80	14.75	14.56	14.50	13.75	13.75
1925	19.15	17.75	16.65	14.60	14.65	15.90	15.90	17 45	17.05	16.30	17.70	15.90
1924	17.50	17.50	16.05	14.80	13.60	13.25	14.80	15 75	16.70	15.95	17.10	18.75
1923	19.40	20.50	23.25	22.75	19.95	16.95	16.60	17 05	18.25	15.30	14.10	16.00
1922	11.80	11.65	12.25	13.25	14.35	14.20	15.20	16.35	19.95	20.40	18.10	17.00
1921	15.65	15.90	13.50	12.05	11.90	10.80	10.25	11.75	13.05	14.65	13.70	12.10
1920	29.00	30.75	30.70	30.70	29.50	28.00	28.10	28.50	27.50	22.50	19.55	16.60
1919	23.30	16.65	17.65	18.50	17.05	18.70	21.20	23.25	21.25	22.00	26.50	27.00
1918	35.00	35.00	35.00*	35.00	35.00	35.00	34.50	33.50	33.50	33.50	33.50	29.00
1917	23.75	24.00	25.75	29.80	32.60	41.75	39.15	35.40	36.25	31.90	30.60	31.50
1916	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915	8.80	8.90	9.00	8.55	8.75	8.75	8.90	10.10	10.75	10.70	12.75	14.90

*Quotations net tons to March 31, 1918, gross tons thereafter

Market History—

No. 1 Railroad Wrought, Eastern Pennsylvania, 1904-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$9.35	$9.00	$9.00	$7.95	$7.75	$6.70	$6.25	$6.25	$7.25	$7.25	$7.25	$6.50
1931	13.25	12.50	11.00	11.00	11.00	10.50	10.00	9.75	9.75	9.50	9.50	9.50
1930	15.25	15.25	15.25	15.75	15.40	15.25	14.25	14.25	14.25	14.25	13.50	13.50
1929	15.50	16.25	16.25	16.25	16.25	16.25	16.25	16.25	16.13	16.00	16.25	15.25
1928	15.25	15.25	15.25	15.25	15.25	15.25	15.25	14.80	15.10	15.50	15.50	15.50
1927	17.00	17.00	17.65	16.75	16.75	16.75	16.25	15.95	15.75	15.75	15.75	15.75
1926	18.35	18.00	18.00	17.75	17.35	17.00	17.00	17.25	17.00	17.00	17.00	17.00
1925	21.50	20.50	19.50	18.40	17.60	18.20	18.25	18.25	18.25	18.25	18.75	18.75
1924	20.10	21.35	19.00	18.40	17.75	17.75	18.05	18.50	18.75	18.75	18.95	19.00
1923	22.25	24.10	27.60	27.00	24.40	22.75	18.85	17.50	19.00	18.00	17.75	19.00
1922	15.00	15.00	15.20	15.63	16.80	17.25	18.00	18.00	20.75	22.00	21.00	18.95
1921	20.00	20.00	18.20	15.50	15.00	15.00	14.25	14.00	14.20	15.40	16.00	15.75
1920	32.90	36.10	36.50	35.25	34.00	33.50	33.50	33.25	34.40	29.85	25.75	20.10
1919	29.80	25.00	24.00	21.50	21.90	22.50	24.70	27.25	27.00	27.00	27.85	30.75
1918	35.00	35.00	35.00*	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917	27.00	26.75	30.00	36.00	40.80	47.85	54.05	46.20	44.50	41.80	35.35	35.00
1916	22.25	22.50	23.00	23.00	22.50	20.00	19.75	20.00	21.00	22.00	20.55	26.75
1915	11.75	12.00	12.50	12.50	12.50	12.75	13.50	15.00	16.00	16.00	17.00	20.00
1914	12.90	14.75	15.25	13.15	13.15	12.65	12.65	12.00	12.50	11.50	11.50	11.50
1913	16.25	16.25	15.25	16.25	15.50	14.75	14.70	14.25	14.25	13.75	13.75	13.35
1912	15.75	14.75	14.50	14.25	16.25	16.00	15.75	15.25	16.65	16.75	17.75	16.75
1911	16.25	16.25	17.75	16.75	15.50	15.25	15.25	15.75	15.75	14.50	14.00	14.45
1910	18.75	19.00	18.75	19.25	18.25	16.75	16.25	16.25	16.15	16.75	16.25	16.25
1909	20.25	19.25	16.25	15.25	16.25	18.60	17.75	18.75	19.75	20.75	21.25	20.25
1908	14.25	14.25	15.25	14.75	15.50	15.75	16.00	16.50	18.25	18.25	18.50	19.75
1907	23.25	22.25	21.00	20.50	20.00	20.75	20.25	19.75	18.00	18.00	17.25	14.75
1906	22.75	21.00	19.75	20.25	20.75	18.25	17.50	18.25	20.75	22.25	22.25	23.25
1905	19.75	21.75	22.00	22.75	21.75	18.75	17.00	17.50	19.50	21.75	19.85	23.25
1904	14.65	16.00	16.50	18.25	17.75	14.00	12.75	13.25	14.40	15.25	16.25	19.00

*Quotations net tons to March 31, 1918, gross tons thereafter.

Machine Shop Turnings, Pittsburgh, 1906-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$6.95	$7.10	$7.25	$6.75	$6.30	$5.25	$5.00	$5.25	$5.95	$6.00	$6.25	$6.00
1931	6.00	6.80	7.80	7.30	6.75	6.50	6.70	7.30	7.50	7.20	7.00	7.00
1930	11.50	11.75	11.00	11.00	10.20	9.50	8.70	8.00	8.00	7.20	6.15	6.00
1929	12.50	11.25	10.65	11.05	11.00	11.35	11.85	12.40	12.00	11.40	10.75	10.25
1928	10.60	10.15	10.15	10.25	9.90	9.20	8.80	9.65	11.00	11.25	10.85	12.00
1927	12.00	11.00	11.60	12.40	11.15	10.50	10.85	12.50	11.75	11.50	11.15	11.45
1926	14.50	13.60	13.00	12.60	11.65	11.00	11.60	12.85	13.05	12.00	11.85	11.50
1925	17.80	16.00	14.75	13.60	12.75	13.25	13.50	14.50	14.85	14.15	14.85	14.50
1924	15.50	16.10	15.00	13.25	11.10	13.00	13.50	14.00	14.75	11.40	16.00	17.50
1923	16.75	18.25	20.65	20.10	18.91	16.60	13.50	11.40	12.75	11.40	11.00	13.50
1922	9.50	9.55	10.65	12.30	13.45	13.65	13.75	13.95	15.45	15.40	16.25	15.90
1921	10.50	10.50	9.70	8.55	8.50	7.90	7.25	7.65	8.55	10.25	10.25	9.20
1920	16.75	19.25	18.40	16.85	15.15	17.65	13.55	15.75	15.80	16.00	14.75	11.60
1919	11.50	9.70	9.75	11.15	10.00	10.65	12.70	14.00	13.25	12.75	14.00	15.50
1918	20.00	20.00	20.00	19.00	18.70	18.50	18.50	18.50	18.50	18.50	18.50	17.75
1917	12.10	12.00	12.45	13.90	14.55	20.80	23.70	21.20	23.25	19.50	19.65	20.00
1916	10.35	9.55	10.75	11.20	10.35	10.05	8.55	7.75	7.25	8.00	9.10	12.75
1915	7.75	7.90	7.90	7.90	7.90	8.15	8.00	7.65	8.65	8.65	9.15	8.75
1914	6.90	7.65	7.65	8.70	8.00	7.90	7.90	7.90	7.90	8.00	7.95	7.75
1913	10.65	10.25	9.50	9.00	8.65	7.25	6.75	6.75	6.75	7.15	7.15	6.40
1912	10.25	9.75	9.50	10.00	10.25	10.90	11.00	11.00	10.65	10.90	11.50	11.25
1911	9.00	9.40	10.50	9.50	9.15	9.15	9.15	9.75	9.65	9.15	9.90	9.35
1910	13.25	13.00	12.00	11.75	11.25	10.25	9.25	9.25	9.00	9.00	9.15	9.25
1909	13.00	11.75	10.25	8.75	8.25	11.25	11.75	11.50	12.50	13.25	13.75	13.25
1908	7.75	8.75	8.75	8.50	8.25	8.25	8.25	9.00	9.50	9.50	10.50	11.75
1907	15.25	15.00	15.75	16.00	15.75	15.50	15.50	15.25	14.50	14.00	11.60	7.75
1906	.....	.....	12.50	11.75	11.25	11.25	11.25	11.50	12.40	12.25	12.40	14.75

Finished Material

Per Pound f.o.b.

Rail Steel Bars, Chicago, 1918-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c	1.50c
1931	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.50	1.50	1.50
1930	1.85	1.85	1.85	1.85	1.80	1.75	1.75	1.65	1.65	1.65	1.65	1.65
1929	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.95	1.90
1928	1.80	1.80	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.90	1.95	2.00
1927	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.80	1.80	1.80
1926	2.00	2.00	2.00	2.00	2.00	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.03	2.13	2.07	2.00	2.10	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1924	2.30	2.30	2.30	2.30	2.20	2.15	2.10	2.05	2.05	2.00	2.00	2.00
1923	2.00	2.00	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
1922	1.60	1.50	1.50	1.55	1.65	1.65	1.70	1.80	1.95	2.00	2.00	2.00
1921	2.50	2.50	2.50	2.15	2.00	2.00	1.95	1.85	1.85	1.75	1.70	1.65
1920	2.90	3.20	3.35	3.70	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
1919	2.80	2.80	2.80	2.55	2.45	2.45	2.45	2.55	2.55	2.55	2.75	2.85
1918	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

No. 10 Blue Annealed, Pittsburgh, 1913-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.75c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c
1931	1.90	1.90	1.90	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
1930	2.15	2.10	2.10	2.10	2.00	2.00	2.00	1.95	1.95	1.95	1.90	1.90
1929	2.10	2.10	2.10	2.15	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.15
1928	2.10	2.10	2.10	2.05	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.10
1927	2.25	2.20	2.20	2.20	2.25	2.25	2.25	2.25	2.25	2.15	2.10	2.10
1926	2.50	2.50	2.50	2.50	2.45	2.35	2.30	2.30	2.30	2.35	2.40	2.40
1925	2.70	2.70	2.65	2.55	2.45	2.30	2.30	2.30	2.25	2.25	2.40	2.50
1924	2.95	2.90	2.95	2.80	2.80	2.80	2.75	2.70	2.70	2.60	2.60	2.70
1923	2.50	2.50	2.70	2.80	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.90
1922	2.25	2.25	2.25	2.35	2.40	2.40	2.40	2.45	2.50	2.60	2.60	2.50
1921	3.55	3.55	3.05	2.95	3.10	3.00	2.55	2.40	2.30	2.50	2.40	2.25
1920	4.05	5.50	5.50	4.85	5.00	5.00	5.00	5.00	5.00	5.00	4.95	3.65
1919	3.90	3.90	3.80	3.55	3.55	3.50	3.50	3.55	3.55	3.55	3.55	3.55
1918	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1917	4.10	4.35	4.70	5.35	6.65	8.00	8.50	8.50	8.50	7.85	4.75	4.25
1916	2.45	2.60	2.85	3.00	3.05	3.10	3.00	3.00	2.95	3.15	3.30	3.90
1915	1.30	1.30	1.30	1.30	1.35	1.35	1.35	1.35	1.50	1.60	1.85	2.25
1914	1.35	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.40	1.40	1.40	1.35
1913	1.70	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.45	1.40

Market History—

Tank Plates, Pittsburgh, 1895-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.55c	1.50c	1.55c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c
1931	1.65	1.65	1.65	1.65	1.65	1.65	1.60	1.60	1.60	1.60	1.60	1.50
1930	1.90	1.85	1.80	1.80	1.75	1.70	1.65	1.65	1.60	1.60	1.60	1.60
1929	1.90	1.90	1.90	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90
1928	1.80	1.85	1.90	1.85	1.85	1.85	1.85	1.85	1.90	1.95	1.95	1.90
1927	1.90	1.85	1.90	1.85	1.85	1.80	1.80	1.80	1.80	1.75	1.75	1.80
1926	1.90	1.85	1.85	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
1925	2.00	2.10	2.10	2.00	2.00	2.00	2.00	1.90	1.80	1.80	1.85	1.90
1924	2.50	2.45	2.40	2.35	2.25	2.15	2.10	2.00	1.95	1.80	1.85	1.90
1923	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921	2.65	2.35	2.05	2.15	2.20	2.00	1.85	1.75	1.70	1.60	1.60	1.50
1920	3.10	3.70	3.75	3.65	3.50	3.50	3.50	3.50	3.50	3.20	3.00	2.65
1919	3.00	3.00	2.90	2.65	2.65	2.65	2.65	2.65	2.55	2.65	2.65	2.70
1918	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917	4.25	4.30	5.00	5.45	6.40	7.75	9.45	9.20	7.50	3.25	3.25	3.25
1916	2.50	2.55	3.15	3.50	3.50	3.50	3.50	3.75	3.70	3.70	3.90	4.25
1915	1.10	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.45	1.70	1.95
1914	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.10	1.10
1913	1.50	1.50	1.50	1.50	1.50	1.45	1.45	1.45	1.40	1.35	1.30	1.20
1912	1.15	1.10	1.10	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.30	1.25	1.20	1.10	1.15
1910	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908	1.70	1.70	1.70	1.70	1.70	1.65	1.60	1.60	1.60	1.60	1.60	1.60
1907	1.70	1.70	1.70	1.70	1.80	1.80	1.80	1.70	1.70	1.70	1.70	1.70
1906	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.70
1905	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.60	1.60	1.60
1904	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.50
1903	1.60	1.60	1.75	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1901	1.40	1.40	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900	2.40	2.20	2.00	1.80	1.60	1.35	1.05	1.10	1.05	1.05	1.35	1.40
1899	1.30	1.45	1.75	2.05	2.10	2.30	2.45	2.55	2.85	2.80	2.50	2.30
1898	1.00	1.00	0.95	1.00	1.10	1.10	1.10	1.10	1.15	1.10	1.10	1.15
1897	1.10	1.10	1.10	1.05	1.05	1.00	1.00	1.00	1.00	1.05	1.00	1.00
1896	1.40	1.35	1.30	1.35	1.30	1.25	1.25	1.20	1.15	1.15	1.10	1.10
1895	1.15	1.10	1.10	1.15	1.20	1.25	1.60	1.70	1.80	1.70	1.60	1.50

Steel Bars, Pittsburgh, 1901-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.55c	1.50c	1.55c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c
1931	1.65	1.65	1.65	1.65	1.65	1.65	1.60	1.60	1.60	1.60	1.60	1.60
1930	1.90	1.85	1.85	1.80	1.75	1.75	1.70	1.65	1.60	1.60	1.60	1.60
1929	1.90	1.90	1.90	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90	1.90
1928	1.80	1.85	1.90	1.85	1.85	1.85	1.85	1.85	1.90	1.95	1.95	1.90
1927	1.95	1.90	1.90	1.90	1.85	1.85	1.80	1.80	1.80	1.75	1.75	1.80
1926	2.00	2.00	2.00	2.00	1.95	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.10	2.10	2.10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1924	2.40	2.40	2.40	2.30	2.25	2.20	2.15	2.10	2.05	2.00	2.05	2.10
1923	2.00	2.15	2.30	2.35	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
1922	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921	2.35	2.15	2.00	2.05	2.10	2.05	1.85	1.75	1.65	1.60	1.55	1.50
1920	3.10	3.85	3.85	3.65	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.35
1919	2.70	2.70	2.60	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.45	2.90
1918	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
1917	3.20	3.20	3.45	3.65	3.65	4.00	4.70	4.75	4.25	2.90	2.90	2.90
1916	2.40	2.40	2.65	3.00	3.00	2.85	2.75	2.55	2.60	2.70	2.95	3.15
1915	1.10	1.10	1.15	1.20	1.20	1.20	1.30	1.35	1.30	1.45	1.70	1.90
1914	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.15	1.10	1.10
1913	1.45	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.35	1.25
1912	1.15	1.15	1.10	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.40	1.40
1911	1.40	1.40	1.40	1.40	1.40	1.25	1.25	1.20	1.15	1.10	1.10	1.10
1910	1.50	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.40	1.40	1.40	1.40
1909	1.40	1.30	1.20	1.15	1.20	1.20	1.25	1.35	1.40	1.40	1.45	1.50
1908	1.60	1.60	1.60	1.60	1.60	1.50	1.40	1.40	1.40	1.40	1.40	1.40
1907	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1906	2.00	1.75	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.55	1.60
1905	1.45	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.70	1.80	1.95
1904	1.30	1.30	1.35	1.35	1.30	1.30	1.30	1.30	1.30	1.35	1.30	1.40
1903	1.65	1.60	1.60	1.60	1.00	1.60	1.60	1.60	1.60	1.60	1.60	1.30
1902	1.60	1.50	1.50	1.65	1.80	1.80	1.70	1.75	1.75	1.70	1.60	1.70
1901	1.20	1.25	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.60

Structural Shapes, Pittsburgh, 1895-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.55c	1.50c	1.55c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c	1.60c
1931	1.60	1.60	1.60	1.65	1.65	1.65	1.60	1.60	1.60	1.60	1.60	1.50
1930	1.90	1.85	1.80	1.80	1.75	1.70	1.65	1.65	1.60	1.60	1.60	1.60
1929	1.90	1.90	1.90	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90
1928	1.80	1.85	1.90	1.85	1.85	1.85	1.85	1.85	1.90	1.95	1.95	1.90
1927	1.95	1.90	1.90	1.90	1.85	1.80	1.80	1.80	1.80	1.75	1.75	1.80
1926	1.90	1.90	1.90	1.90	1.90	1.90	2.00	2.00	2.00	2.00	2.00	2.00
1925	2.10	2.10	2.10	2.00	2.00	2.00	2.00	2.00	1.90	1.90	2.00	1.95
1924	2.50	2.50	2.50	2.35	2.25	2.20	2.15	2.05	2.00	2.00	2.00	2.00
1923	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	1.95
1921	2.45	2.25	2.10	2.15	2.20	2.05	1.90	1.75	1.70	1.60	1.60	1.50
1920	2.65	3.15	3.25	3.25	3.25	3.25	3.25	3.15	3.10	3.10	3.00	2.45
1919	2.80	2.80	2.70	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.50
1918	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1917	3.10	3.25	3.45	3.70	4.00	4.00	4.50	4.50	3.75	3.00	3.00	3.00
1916	1.85	2.05	2.40	2.50	2.50	2.50	2.50	2.50	2.60	2.70	2.90	3.00
1915	1.10	1.10	1.15	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.65	1.75
1914	1.20	1.20	1.20	1.20	1.15	1.10	1.10	1.15	1.20	1.15	1.10	1.05
1913	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.35	1.30	1.25
1912	1.15	1.15	1.15	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.30	1.20	1.15
1910	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908	1.70	1.70	1.70	1.70	1.70	1.65	1.65	1.60	1.60	1.60	1.60	1.60
1907	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1906	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1905	1.50	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.70	1.70	1.70	1.70
1904	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.40
1903	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902	1.60	1.60	1.70	1.85	2.00	2.25	2.25	2.35	2.25	2.15	2.10	2.00
1901	1.50	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900	2.25	2.25	2.25	2.25	2.25	2.05	1.90	1.75	1.70	1.70	1.70	1.70
1899	1.30	1.30	1.40	1.50	1.50	1.75	1.95	2.05	2.25	2.25	2.25	2.25
1898	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.20	1.20	1.20
1897	1.55	1.55	1.55	1.55	1.30	1.05	1.00	1.00	1.00	1.10	1.10	1.10
1896	1.45	1.50	1.45	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.50	1.45
1895	1.25	1.20	1.20	1.20	1.20	1.35	1.50	1.60	1.65	1.60	1.60	1.55

Market History—

Bar Iron, Chicago, 1907-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1932.....	1.60c	1.70c	1.70c	1.70c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c	1.65c
1931.....	1.70	1.75	1.70	1.80	1.80	1.70	1.70	1.70	1.70	1.70	1.65	1.60
1930.....	2.00	1.95	1.95	1.95	1.90	1.90	1.90	1.80	1.75	1.75	1.70	1.70
1929.....	2.00	2.05	2.00	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.00	2.00
1928.....	1.90	1.95	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1927.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.90	1.85	1.90
1926.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1925.....	2.00	2.00	2.10	2.10	2.10	2.05	1.95	1.90	1.90	1.90	2.00	2.00
1924.....	2.40	2.40	2.40	2.35	2.30	2.25	2.20	2.15	2.15	2.10	2.10	2.00
1923.....	2.35	2.45	2.55	2.60	2.60	2.60	2.55	2.50	2.40	2.40	2.40	2.40
1922.....	1.60	1.60	1.60	1.65	1.65	1.75	1.80	2.00	2.25	2.50	2.50	2.35
1921.....	2.75	2.65	2.65	2.50	2.45	2.25	1.95	1.75	1.75	1.75	1.70	1.65
1920.....	3.15	3.45	3.50	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.50
1919.....	3.15	2.95	2.85	2.55	2.50	2.55	2.65	2.65	2.65	2.70	2.75	2.75
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.00	3.20	3.40	4.00	4.50	4.50	4.50	4.50	4.00	4.00
1916.....	1.85	1.90	2.20	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.50	2.60
1915.....	0.95	1.05	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.50	1.70
1914.....	1.15	1.20	1.15	1.15	1.10	1.10	1.05	1.05	1.05	1.05	0.95	0.95
1913.....	1.60	1.60	1.60	1.55	1.55	1.55	1.50	1.45	1.35	1.25	1.15	1.15
1912.....	1.15	1.15	1.15	1.15	1.25	1.25	1.35	1.40	1.45	1.50	1.55	1.55
1911.....	1.30	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.15	1.15	1.15
1910.....	1.60	1.60	1.55	1.55	1.50	1.45	1.40	1.40	1.40	1.35	1.35	1.30
1909.....	1.50	1.50	1.40	1.30	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908.....	1.60	1.55	1.55	1.55	1.55	1.55	1.50	1.50	1.50	1.50	1.50	1.50
1907.....	1.80	1.80	1.80	1.80	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

No. 24 Black Sheets, Pittsburgh, 1907-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932.....	2.20c	2.15c	2.20c	2.20c	2.20c	2.20c	2.20c	2.15c	2.10c	2.10c	2.10c	2.20c
1931.....	2.35	2.35	2.35	2.25	2.25	2.15	2.40	2.40	2.40	2.40	2.40	2.40
1930.....	2.70	2.65	2.65	2.65	2.55	2.55	2.55	2.50	2.40	2.40	2.35	2.35
1929.....	2.85	2.85	2.85	2.90	2.95	2.95	2.85	2.85	2.85	2.80	2.75	2.75
1928.....	2.80	2.85	2.85	2.75	2.75	2.70	2.65	2.65	2.70	2.70	2.80	2.85
1927.....	2.95	2.90	2.90	2.80	2.90	3.00	3.00	3.00	3.00	2.95	2.80	2.75
1926.....	3.35	3.35	3.25	3.25	3.20	3.10	3.10	3.10	*3.05	3.05	3.10	3.10
1925.....	3.50	3.50	3.40	3.35	3.25	3.15	3.15	3.15	3.10	3.10	3.25	3.35
1924.....	3.75	3.75	3.75	3.70	3.65	3.65	3.60	3.50	3.45	3.40	3.45	3.50
1923.....	3.35	3.35	3.55	3.85	3.85	3.85	3.85	3.85	3.75	3.75	3.75	3.75
1922.....	3.00	3.00	3.00	3.10	3.15	3.15	3.15	3.25	3.40	3.50	3.35	3.30
1921.....	4.35	4.20	3.90	3.90	4.00	3.90	3.35	3.05	2.80	3.00	2.95	3.00
1920.....	5.00	6.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00	6.05	4.45
1919.....	4.70	4.70	4.60	4.35	4.35	4.30	4.30	4.35	4.35	4.35	4.35	4.35
1918.....	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1917.....	4.55	4.55	5.05	5.75	7.00	8.15	9.00	9.00	8.75	7.75	5.30	5.00
1916.....	2.55	2.60	2.75	2.90	2.95	2.90	2.90	2.75	2.85	3.20	3.65	4.45
1915.....	1.80	1.80	1.80	1.80	1.80	1.80	1.75	1.85	1.90	2.05	2.20	2.50
1914.....	1.85	1.95	1.95	1.90	1.85	1.80	1.80	1.90	1.95	1.95	1.90	1.80
1913.....	2.30	2.35	2.35	2.35	2.35	2.30	2.25	2.20	2.10	2.00	1.95	1.90
1912.....	1.90	1.85	1.80	1.85	1.95	1.95	2.00	2.05	2.10	2.20	2.25	2.25
1911.....	2.20	2.20	2.20	2.15	2.15	2.00	2.00	1.95	1.90	1.85	1.85	1.90
1910.....	2.40	2.40	2.40	2.35	2.30	2.25	2.20	2.20	2.15	2.15	2.15	2.15
1909.....	2.40	2.40	2.30	2.20	2.20	2.20	2.20	2.20	2.20	2.30	2.40	2.40
1908.....	2.55	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1907.....	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

*No. 28 gage before Sept. 1, 1926.

Automobile Sheets, Pittsburgh, 1922-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932.....	2.90c	2.85c	2.85c	2.80c	2.80c	2.80c	2.80c	2.70c	2.75c	2.65c	2.60c	2.60c
1931.....	3.30	3.30	3.30	3.15	3.05	3.10	3.10	3.10	3.10	3.10	3.10	3.00
1930.....	3.90	3.90	3.90	3.80	3.80	3.60	3.60	3.60	3.60	3.45	3.35	3.30
1929.....	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.05	4.00	4.00
1928.....	4.00	4.10	4.15	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.05	4.10
1927.....	4.20	4.15	4.15	4.15	4.25	4.25	4.25	4.25	4.25	4.15	4.15	4.10
1926.....	4.50	4.40	4.40	4.35	4.30	4.25	4.20	4.25	*4.25	4.25	4.25	4.25
1925.....	4.75	4.70	4.55	4.45	4.35	4.30	4.25	4.25	4.25	4.35	4.45	4.50
1924.....	5.35	5.35	5.30	5.35	5.10	5.10	5.10	4.85	4.75	4.60	4.65	4.70
1923.....	4.85	4.95	5.35	5.50	5.50	5.50	5.35	5.35	5.35	5.35	5.35	5.35
1922.....	....	....	....	....	....	....	....	....	....	....	4.85	4.85

*No. 22 gage previous to September, 1926; No. 20 gage since.

No. 24 Galvanized Sheets, Pittsburgh, 1903-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1932.....	2.80c	2.75c	2.80c	2.85c	2.85c	2.85c	2.85c	2.80c	2.75c	2.80c	2.85c	2.85c
1931.....	2.90	2.90	2.90	2.85	2.80	2.80	2.90	2.90	2.90	2.90	2.90	2.90
1930.....	3.35	3.30	3.30	3.30	3.25	3.20	3.15	3.10	3.00	3.00	2.95	2.90
1929.....	3.60	3.60	3.60	3.65	3.70	3.65	3.60	3.55	3.50	3.50	3.45	3.40
1928.....	3.65	3.65	3.75	3.65	3.65	3.55	3.50	3.50	3.50	3.50	3.55	3.60
1927.....	3.80	3.70	3.70	3.65	3.80	3.80	3.85	3.85	3.85	3.80	3.70	3.60
1926.....	4.60	4.60	4.60	4.60	4.55	4.30	4.30	4.30	*3.95	3.90	3.95	3.95
1925.....	4.75	4.75	4.70	4.55	4.35	4.20	4.20	4.20	4.20	4.25	4.50	4.60
1924.....	4.95	4.90	4.90	4.85	4.80	4.80	4.70	4.60	4.60	4.60	4.60	4.60
1923.....	4.35	4.35	4.65	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.85	4.90
1922.....	4.00	4.00	4.00	4.10	4.15	4.15	4.15	4.25	4.40	4.50	4.35	4.35
1921.....	5.70	5.50	5.05	4.90	5.00	4.90	4.35	4.05	3.80	4.00	3.95	4.00
1920.....	6.35	7.00	7.25	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.35	5.85
1919.....	6.05	6.05	5.95	5.70	5.70	5.65	5.65	5.70	5.70	5.70	5.70	5.70
1918.....	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1917.....	6.55	6.80	6.80	7.55	8.80	9.95	10.25	10.25	9.70	8.80	6.50	6.25
1916.....	4.75	4.75	4.80	4.85	4.85	4.80	4.35	4.25	4.20	4.45	5.05	6.25
1915.....	2.75	3.00	3.40	3.30	3.40	4.45	4.55	3.95	3.65	3.50	3.90	4.75
1914.....	2.85	2.95	2.95	2.90	2.80	2.75	2.75	2.85	2.95	2.95	2.85	2.80
1913.....	3.45	3.50	3.50	3.50	3.40	3.40	3.30	3.25	3.15	3.05	2.95	2.85
1912.....	3.20	3.20	3.00	3.00	3.10	3.10	3.10	3.30	3.50	3.50	3.50	3.50
1911.....	3.20	3.20	3.20	3.20	3.20	3.00	3.00	3.00	2.80	3.00	3.00	3.20
1910.....	3.70	3.70	3.70	3.70	3.50	3.20	3.20	3.20	3.20	3.20	3.20	3.20
1909.....	3.40	3.30	3.40	3.40	3.40	3.50	3.50	3.50	3.60	3.60	3.70	3.70
1908.....	3.70	3.70	3.70	3.60	3.50	3.50	3.50	3.50	3.30	3.30	3.20	3.20
1907.....	4.00	4.00	4.00	3.80	3.80	3.80	3.70	3.70	3.60	3.60	3.50	3.50
1906.....	3.60	3.60	3.70	3.80	3.80	3.80	3.80	3.90	3.80	4.00	4.00	4.00
1905.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1904.....	3.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.50
1903.....	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.50	3.50	3.50

*No. 28 gage before Sept. 1, 1926.

Tin Plate, Pittsburgh, 1903-1932

Per Base Box, 100 lbs., Pittsburgh

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.75	$4.50	$4.25
1931	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.75	4.75	4.75
1930	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.00	5.00	5.00
1929	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
1928	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.30	5.35
1927	5.50	5.50	5.50	5.50	5.50	5.45	5.50	5.50	5.50	5.30	5.30	5.25
1926	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1925	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1924	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1923	4.75	4.75	4.95	4.95	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1922	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
1921	7.00	7.00	7.00	6.65	6.25	6.25	5.65	5.25	5.15	5.00	4.80	4.75
1920	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1919	7.35	7.35	7.25	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1918	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75
1917	6.90	7.00	7.50	7.50	7.90	9.25	10.00	10.00	10.00	10.00	8.20	7.75
1916	3.75	3.75	4.15	4.70	5.15	5.55	5.80	6.00	5.60	5.75	6.05	6.50
1915	3.10	3.10	3.10	3.20	3.20	3.10	3.10	3.10	3.10	3.10	3.35	3.60
1914	3.40	3.40	3.40	3.40	3.40	3.30	3.25	3.45	3.55	3.35	3.15	3.20
1913	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.55	3.50	3.40
1912	3.40	3.40	3.50	3.50	3.50	3.50	3.50	3.70	3.70	3.70	3.70	3.60
1911	3.70	3.70	3.70	3.60	3.60	3.60	3.60	3.50	3.50	3.40	3.40	3.40
1910	3.50	3.50	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
1909	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.50	3.50	3.50
1908	3.60	3.60	3.60	3.60	3.60	3.50	3.50	3.50	3.50	3.50	3.50	3.40
1907	3.90	3.90	3.90	3.90	3.80	3.80	3.70	3.70	3.70	3.60	3.60	3.60
1906	3.50	3.50	3.50	3.60	3.70	3.70	3.80	3.90	3.90	3.90	4.00	4.00
1905	3.50	3.50	3.50	3.50	3.50	3.40	3.40	3.40	3.30	3.30	3.40	3.50
1904	3.40	3.40	3.30	3.30	3.20	3.20	3.20	3.10	3.30	3.40	3.50	3.50
1903	3.80	3.80	3.90	3.90	3.80	3.80	3.70	3.70	3.60	3.60	3.60	3.50

Plain Wire, Pittsburgh, 1912-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c	2.20c
1931	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1930	2.40	2.40	2.40	2.40	2.35	2.30	2.30	2.30	2.30	2.30	2.30	2.25
1929	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.45	2.40	2.40	2.40
1928	2.40	2.45	2.50	2.50	2.50	2.50	2.45	2.40	2.40	2.40	2.40	2.50
1927	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
1926	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925	2.60	2.60	2.60	2.55	2.50	2.45	2.50	2.50	2.50	2.50	2.50	2.50
1924	2.75	2.75	2.75	2.75	2.70	2.65	2.60	2.60	2.55	2.50	2.50	2.60
1923	2.45	2.60	2.65	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922	2.25	2.20	2.25	2.25	2.25	2.25	2.25	2.25	2.40	2.45	2.45	2.45
1921	3.25	3.20	3.00	3.00	3.00	2.75	2.50	2.50	2.60	2.60	2.60	2.25
1920	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.20	3.25	3.25	3.25
1919	3.25	3.25	3.20	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.15	3.25
1918	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917	2.95	2.95	3.10	3.20	3.45	3.60	3.95	3.95	3.95	3.85	3.25	3.25
1916	1.95	2.10	2.25	2.25	2.45	2.45	2.45	2.55	2.55	2.60	2.80	2.95
1915	1.30	1.35	1.40	1.40	1.35	1.35	1.40	1.40	1.55	1.60	1.70	1.90
1914	1.35	1.40	1.40	1.40	1.35	1.30	1.30	1.35	1.35	1.40	1.40	1.30
1913	1.55	1.55	1.55	1.60	1.60	1.60	1.50	1.45	1.45	1.40	1.40	1.35
1912	1.35	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.50	1.55	1.55	1.55

Wire Nails, Pittsburgh, 1907-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95	$1.95
1931	1.90	1.90	1.90	1.90	1.90	1.80	1.85	1.90	1.90	1.90	1.90	1.90
1930	2.35	2.30	2.30	2.25	2.15	2.15	2.10	2.05	2.00	2.00	1.95	1.90
1929	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.50	2.45	2.40	2.40
1928	2.50	2.60	2.65	2.60	2.60	2.60	2.55	2.55	2.55	2.55	2.55	2.65
1927	2.65	2.60	2.55	2.55	2.50	2.55	2.55	2.55	2.55	2.55	2.50	2.50
1926	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
1925	2.85	2.85	2.85	2.20	2.25	2.75	2.65	2.65	2.65	2.65	2.65	2.65
1924	3.00	3.00	3.00	3.00	2.95	2.90	2.85	2.85	2.80	2.75	2.75	2.85
1923	2.70	2.75	2.90	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1922	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.65	2.70	2.70	2.70
1921	3.25	3.00	3.00	3.25	3.25	3.00	2.75	2.75	2.90	2.90	2.90	2.50
1920	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1919	3.50	3.50	3.45	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.45	3.50
1918	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917	3.00	3.00	3.15	3.20	3.50	3.65	4.00	4.00	4.00	3.90	3.50	3.50
1916	2.15	2.20	2.40	2.40	2.50	2.50	2.50	2.60	2.60	2.65	2.85	3.00
1915	1.50	1.55	1.60	1.60	1.55	1.55	1.60	1.60	1.70	1.75	1.85	2.00
1914	1.55	1.60	1.60	1.60	1.60	1.55	1.55	1.55	1.60	1.60	1.60	1.50
1913	1.75	1.75	1.75	1.80	1.80	1.80	1.75	1.70	1.65	1.60	1.60	1.60
1912	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.65	1.70	1.70	1.75	1.75
1911	1.70	1.75	1.80	1.80	1.75	1.80	1.70	1.70	1.65	1.65	1.55	1.55
1910	1.85	1.85	1.85	1.85	1.80	1.80	1.70	1.70	1.70	1.70	1.65	1.70
1909	1.95	1.95	1.95	1.95	1.60	1.70	1.70	1.80	1.80	1.80	1.80	1.85
1908	2.05	2.05	2.05	2.05	2.05	2.00	1.95	1.95	1.95	1.95	1.95	1.95
1907	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.05	2.05	2.05

Cold-Rolled Strip, Pittsburgh, 1910-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	2.00c	1.90c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	2.00c	1.95c	2.00c	2.00c
1931	2.25	2.25	2.25	2.20	2.15	2.15	2.15	2.15	2.15	2.15	2.10	2.05
1930	2.70	2.65	2.60	2.55	2.50	2.45	2.45	2.40	2.35	2.35	2.35	2.25
1929	2.85	2.85	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1928	3.00	3.10	3.15	*2.75	2.75	2.75	2.75	2.70	2.75	2.75	2.80	2.85
1927	3.10	2.90	2.95	3.00	3.00	3.25	3.25	3.25	3.15	2.95	2.95	3.00
1926	3.90	3.90	3.90	3.85	3.75	3.70	3.65	3.50	3.50	3.50	3.25	3.25
1925	4.10	4.15	4.05	4.00	3.85	3.65	3.75	3.75	3.75	3.75	3.90	3.90
1924	5.00	4.80	4.80	4.75	4.50	4.50	4.35	4.20	4.00	4.00	4.00	4.15
1923	4.50	4.65	4.80	5.15	5.25	5.25	5.00	5.00	5.00	5.00	5.00	4.75
1922	3.50	3.50	3.50	3.60	3.70	3.95	4.00	4.00	4.25	4.50	4.50	4.50
1921	6.25	6.25	5.65	5.50	5.50	5.00	4.40	3.90	3.75	3.75	3.80	3.75
1920	5.65	7.00	8.80	8.50	8.50	8.50	8.50	8.50	7.35	8.50	8.00	6.85
1919	6.25	6.25	6.10	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65
1918	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1917	6.50	6.50	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.50	6.50
1916	4.25	4.65	5.50	6.00	6.00	6.00	6.00	6.00	6.00	6.50	6.50	6.50
1915	2.75	2.75	2.75	2.75	2.75	2.85	2.85	3.00	3.10	3.25	3.50	3.75
1914	3.05	3.05	3.05	3.05	3.05	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1913	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.05
1912	2.95	2.95	2.95	2.95	3.00	3.05	3.05	3.05	3.05	3.15	3.20	3.25
1911	2.95	2.95	3.25	3.25	3.25	2.95	2.95	2.95	2.95	2.95	2.95	2.95
1910	....	....	....	....	....	....	2.95	2.95	2.95	2.95	2.95	2.95

*April, 1928, and subsequently, prices are for 3 tons or over, instead of less than 3 tons.

Market History—

Cold-Finished Steel Bars, Pittsburgh, 1920-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	2.00c	2.00c	1.90c	1.90c	1.75c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c	1.70c
1931	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.00
1930	2.15	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.05	2.00
1929	2.20	2.20	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.20	2.20
1928	2.30	2.25	2.25	2.20	2.20	2.15	2.10	2.15	2.20	2.20	2.20	2.20
1927	2.35	2.35	2.40	2.40	2.40	2.35	2.30	2.30	2.20	2.15	2.10	2.10
1926	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.45	2.40	2.40
1925	2.80	2.80	2.75	2.70	2.70	2.60	2.55	2.50	2.50	2.45	2.50	2.50
1924	3.00	3.00	3.00	3.00	3.00	2.90	2.85	2.80	2.75	2.70	2.70	2.80
1923	2.50	2.65	2.85	3.00	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.90
1922	2.00	1.90	1.85	1.85	2.00	2.00	2.05	2.15	2.50	2.50	2.50	2.50
1921	3.60	3.60	3.10	3.05	3.10	3.00	2.75	2.50	2.40	2.25	2.15	2.00
1920	3.65	3.85	4.50	5.25	4.40	4.50	4.10	4.55	4.25	4.10	4.00	3.60

Hot-Rolled Strip, Wide, Pittsburgh, 1917-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.40c	1.40c	1.40c	1.45c	1.50c	1.50c	1.45c	1.45c	1.45c	1.45c	1.45c	1.45c
1931	1.55	1.55	1.55	1.55	1.50	1.50	1.55	1.55	1.55	1.55	1.50	1.45
1930	1.85	1.80	1.80	1.70	1.70	1.70	1.65	1.65	1.65	1.60	1.55	1.55
1929	1.80	1.85	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
1928	1.85	1.85	1.90	1.90	1.85	1.85	1.90	1.85	1.80	1.80	1.80	1.80
1927	2.20	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.00	1.90
1926	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
1925	2.35	2.40	2.35	2.20	2.20	2.20	2.20	2.20	2.20	2.25	2.30	2.30
1924	3.00	2.95	2.85	2.75	2.60	2.55	2.50	2.50	2.45	2.35	2.25	2.35
1923	2.75	2.85	3.10	3.30	3.30	3.30	3.20	3.15	3.10	3.00	3.00	2.75
1922	2.00	1.80	1.80	1.95	2.05	2.35	2.50	2.50	2.75	2.90	2.90	2.80
1921	3.30	3.30	2.85	2.75	2.75	2.70	2.50	2.30	2.15	2.15	2.25	2.00
1920	3.70	4.80	5.25	5.45	5.50	5.50	5.50	5.50	5.50	5.50	5.00	3.90
1919	3.80	3.55	3.30	3.25	3.05	3.05	3.10	3.30	3.30	3.30	*3.30	*3.30
1918	4.50	4.50	4.50	4.50	4.25	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917	....	....	....	....	....	7.25	7.25	7.25	7.00	7.00	5.25	4.50

*First quarter 1920 delivery.

Hot-Rolled Strip, Narrow, Pittsburgh, 1928-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	1.50c	1.50c	1.50c	1.55c	1.60c	1.60c	1.45c	1.45c	1.45c	1.45c	1.45c	1.45c
1931	1.65	1.65	1.65	1.65	1.60	1.60	1.65	1.65	1.65	1.65	1.60	1.55
1930	1.95	1.90	1.90	1.80	1.80	1.80	1.75	1.75	1.75	1.70	1.65	1.65
1929	1.90	1.95	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
1928	2.10	2.10	2.10	2.05	2.00	2.00	2.00	1.95	1.95	2.00	1.90	1.90

Hoops, Pittsburgh, 1908-1928

This designation was superseded in 1928 by narrow hot rolled strip

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1928	2.10c	2.15c	2.20c	2.15c	2.15c	2.10c	2.10c	2.05c	2.10c	2.10c	2.00c	2.00c
1927	2.40	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.20	2.15
1926	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925	2.45	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.45	2.50	2.50
1924	3.00	3.00	2.85	2.75	2.75	2.70	2.60	2.60	2.55	2.50	2.50	2.50
1923	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922	1.95	1.85	1.80	1.95	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921	3.05	3.05	2.70	2.75	2.75	2.70	2.45	2.40	2.30	2.25	2.20	2.15
1920	3.05	3.05	3.50	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918	3.50	3.50	3.05	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917	3.50	3.50	3.90	4.10	4.70	5.75	6.00	6.00	6.00	6.00	4.60	3.50
1916	2.00	2.25	2.55	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.25	3.25
1915	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.30	1.40	1.50	1.75	1.95
1914	1.40	1.30	1.30	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
1913	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.50	1.40
1912	1.30	1.25	1.25	1.25	1.25	1.25	1.35	1.40	1.40	1.45	1.50	1.50
1911	1.50	1.50	1.45	1.45	1.45	1.45	1.40	1.40	1.35	1.35	1.30	1.30
1910	1.60	1.60	1.60	1.60	1.50	1.55	1.55	1.55	1.50	1.50	1.50	1.50
1909	1.80	1.75	1.60	1.60	1.50	1.40	1.40	1.40	1.50	1.50	1.50	1.55
1908	2.00	2.00	2.00	2.00	2.00	1.90	1.80	1.80	1.80	1.80	1.80	1.80

Bands, Pittsburgh, 1916-1928

This designation was superseded in 1928 by narrow hot rolled strip.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1928	2.10	2.10	2.10	2.05	2.00	2.00	2.00	1.95	1.95	2.00	1.90	1.90
1927	2.40	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.20	2.15
1926	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.45	2.50	2.50
1924	3.00	3.00	2.85	2.75	2.75	2.70	2.60	2.60	2.40	2.40	2.40	2.40
1923	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922	1.75	1.75	1.70	1.85	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921	3.05	3.05	2.70	2.75	2.75	2.70	2.35	2.20	2.20	2.25	2.15	2.00
1920	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918	2.90	2.90	2.90	2.90	3.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917	3.00	3.00	3.35	3.35	3.60	5.50	6.00	6.00	6.00	6.00	4.30	2.90
1916	1.85	2.05	2.35	2.50	2.50	2.50	2.50	2.60	2.60	2.60	2.75	2.90

Market History—

Angle Bars, Chicago, 1914-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.65c	2.65c
1931	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1930	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1929	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1928	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1927	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1926	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1925	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1924	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1923	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.50	2.75	2.75	2.75
1921	2.75	2.75	2.75	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.55
1920	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1919	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.15
1917	2.25	2.25	2.35	2.75	2.95	3.25	3.45	3.25	3.25	3.25	3.25	3.25
1916	1.50	1.50	1.50	1.50	1.90	2.00	2.00	2.00	2.00	2.15	2.25	2.25
1915	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
1914	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

Tie Plates, Chicago, 1915-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.
1932	1.85c	1.85c	1.85c	1.85c	1.85c	1.85c	1.85c	1.85c	1.85c	1.75c	1.75c	1.75c
1931	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90
1930	2.10	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.00	1.95
1929	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
1928	2.25	2.25	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
1927	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.25	2.25
1926	2.30	2.25	2.25	2.25	2.25	2.25	2.25	2.30	2.35	2.35	2.35	2.35
1925	2.35	2.45	2.45	2.40	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
1924	2.60	2.60	2.60	2.60	2.60	2.60	2.55	2.45	2.45	2.35	2.35	2.35
1923	2.40	2.45	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
1922	1.90	1.85	1.75	1.80	1.85	1.85	1.85	2.00	2.20	2.35	2.35	2.35
1921	3.00	3.00	3.00	2.75	2.50	2.50	2.40	2.15	2.00	2.00	2.00	1.90
1920	2.75	2.75	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.00	3.00	3.00
1919	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917	2.75	2.75	2.90	3.00	3.00	3.00	3.40	3.50	3.50	3.50	3.50	3.45
1916	1.80	2.05	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.75
1915	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.50	1.70	1.80

Track Bolts, Chicago, 1914-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c	3.50c
1931	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.70
1930	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
1929	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
1928	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
1927	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.80	3.80	3.80
1926	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1925	3.90	4.00	4.00	4.00	3.95	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1924	4.10	4.10	4.10	4.10	4.10	4.10	3.90	3.80	3.80	3.80	3.80	3.80
1923	3.90	4.05	4.15	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1922	3.60	3.50	3.50	3.60	3.90	3.90	3.60	3.60	3.80	3.85	3.85	3.85
1921	5.00	5.00	5.00	4.85	4.75	4.45	4.40	4.15	3.65	3.65	3.65	3.60
1920	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.75	4.95	5.00	5.00	5.00
1919	4.90	4.90	4.90	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
1918	4.90	4.85	5.05	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
1917	4.25	4.50	4.50	4.55	5.00	5.05	5.55	5.25	5.25	5.25	5.25	5.15
1916	2.60	2.65	3.20	3.25	3.25	3.25	3.25	3.25	3.25	3.60	4.20	4.25
1915	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.10	2.10	2.35	2.50
1914	2.05	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Railroad Spikes, Pittsburgh, 1916-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	2.60c	2.60c	2.60c	2.60c	2.60c	2.60c	2.60c	2.60c	2.60c	2.40c	2.40c	2.40c
1931	2.80	2.80	2.80	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.65
1930	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
1929	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
1928	2.70	2.75	2.75	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
1927	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
1926	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.75	2.80	2.80	2.80	2.80
1925	2.90	2.90	2.85	2.80	2.80	2.80	2.80	2.75	2.75	2.80	2.80	2.80
1924	3.05	3.05	3.05	3.00	2.95	2.90	2.80	2.80	2.75	2.70	2.75	2.80
1923	2.85	2.90	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.05
1922	2.25	2.15	2.05	2.20	2.25	2.30	2.25	2.30	2.80	2.80	2.75	2.75
1921	3.65	3.65	3.30	3.30	3.25	3.25	3.00	2.75	2.45	2.35	2.30	2.25
1920	3.45	3.70	3.95	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.75
1919	3.65	3.65	3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
1918	4.00	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1917	3.40	3.40	3.50	3.65	3.90	4.20	4.70	6.20	6.50	6.15	5.00	4.75
1916	2.15	2.25	2.50	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	3.25

Structural Rivets, Pittsburgh, 1913-1932

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept	Oct.	Nov.	Dec
1932	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c	2.25c
1931	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.55	2.30	2.25	2.25
1930	3.10	3.10	3.10	3.10	3.00	2.90	2.90	2.75	2.75	2.75	2.75	2.75
1929	2.85	2.90	2.95	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
1928	2.75	2.75	2.80	2.90	2.90	2.90	2.90	2.85	2.80	2.80	2.80	2.80
1927	2.35	2.30	2.30	2.75	2.75	2.75	2.75	2.85	2.85	2.75	2.75	2.75
1926	2.55	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1925	2.60	2.55	2.50	2.50	2.45	2.40	2.45	2.40	2.40	2.40	2.60	2.60
1924	2.85	2.75	2.75	2.65	2.60	2.55	2.50	2.50	2.55	2.60	2.60	2.60
1923	3.00	3.00	3.25	3.25	3.25	3.25	3.15	3.00	3.00	3.00	2.75	2.90
1922	2.25	2.00	2.00	2.05	2.20	2.35	2.40	2.45	3.00	3.00	3.00	3.00
1921	4.15	3.90	3.70	3.60	3.30	3.00	2.70	2.35	2.30	2.40	2.30	2.30
1920	4.15	4.40	4.50	4.50	4.50	4.50	4.50	4.50	4.60	4.75	4.75	4.50
1919	4.40	4.20	4.20	3.70	3.70	3.70	3.70	3.90	3.90	3.90	4.00	4.05
1918	4.65	4.65	4.65	4.65	4.60	4.40	4.40	4.40	4.40	4.40	4.40	4.40
1917	4.25	4.25	4.50	4.75	5.05	5.25	5.25	5.25	5.25	5.25	5.00	4.65
1916	2.60	2.75	3.10	3.35	3.90	4.25	4.05	4.00	4.00	4.00	4.10	4.25
1915	1.45	1.45	1.45	1.45	1.45	1.50	1.50	1.50	1.60	1.75	2.30	2.45
1914	1.60	1.60	1.60	1.60	1.60	1.55	1.50	1.50	1.55	1.50	1.45	1.45
1913	2.20	2.20	2.20	2.20	2.15	2.15	2.10	2.00	2.00	1.90	1.80	1.75

Market History—

Cast Iron Pipe, New York, 1915-1932

6-inch and Larger

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$28.00	$28.00	$28.00	$28.00	$28.00	$26.50	$26.00	$30.00	$32.00	$32.00	$32.00	$32.00
1931	38.10	37.50	37.50	37.50	35.75	34.50	33.70	32.00	28.50	29.10	29.00	28.00
1930	36.90	38.50	38.50	38.50	38.50	38.50	38.50	38.50	38.50	38.50	38.50	38.50
1929	38.85	39.80	39.80	39.05	38.20	38.00	37.90	37.50	37.50	37.50	36.75	36.50
1928	37.15	36.75	36.75	37.25	37.65	38.25	38.08	37.60	37.60	37.10	37.20	38.60
1927	49.50	49.50	49.50	49.50	48.60	47.95	46.00	44.00	38.25	36.90	37.25	37.25
1926	51.50	51.50	51.50	52.75	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50
1925	61.05	61.05	60.05	58.15	58.05	57.05	57.05	57.05	56.50	57.05	57.05	57.05
1924	66.10	66.10	66.10	66.10	66.10	65.10	65.10	64.10	64.10	64.10	62.10	60.60
1923	56.50	57.30	58.40	58.70	59.00	59.00	59.00	59.20	63.60	63.60	62.80	66.60
1922	47.30	47.30	47.60	48.80	48.80	49.80	53.30	54.50	55.30	55.30	55.30	55.30
1921	63.30	63.30	63.30	63.30	61.30	52.70	48.55	47.05	45.30	47.55	47.30	47.30
1920	67.30	70.30	71.30	73.30	76.30	76.30	76.30	76.30	77.20	77.20	77.20	77.20
1919	66.20	62.70	61.65	57.70	56.70	52.70	52.70	53.10	54.30	56.70	58.30	61.30
1918	55.35	55.35	55.35	55.35	56.55	61.35	62.30	62.50	62.70	67.50	67.70	67.70
1917	41.50	41.50	41.90	51.25	55.50	60.75	65.50	65.50	65.50	56.50	56.10	54.75
1916	29.00	29.40	29.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	34.50	41.00
1915	20.00	20.00	20.25	20.50	20.50	20.50	21.75	22.15	23.40	24.00	25.00	26.40

Cast Iron Pipe, Chicago, 1915-1932

6-inch and Larger

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$40.40	$38.80	$38.40	$34.40	$34.40	$34.40	$34.40	$34.40	$38.90	$40.40	$40.40	$40.00
1931	45.20	45.20	43.70	42.10	42.00	42.00	42.00	39.00	40.00	40.00	40.00	40.00
1930	44.40	45.20	45.20	45.20	44.00	43.20	44.80	45.20	45.20	45.20	45.20	45.20
1929	45.20	45.20	45.20	45.20	45.20	45.20	45.20	45.20	45.20	45.20	45.20	45.20
1928	36.20	36.20	36.70	38.20	39.00	39.00	41.45	42.00	42.20	42.70	45.00	45.20
1927	45.70	43.70	44.00	44.20	43.20	42.80	42.20	38.95	36.20	34.30	35.30	35.30
1926	48.70	49.20	49.20	49.20	49.45	48.95	47.45	47.45	47.80	47.20	47.20	47.20
1925	49.00	50.20	48.20	46.10	46.95	47.95	48.20	49.20	49.45	49.20	50.20	50.20
1924	56.00	57.20	57.20	56.95	55.40	55.20	52.20	52.70	52.20	50.00	48.00	47.00
1923	51.20	53.20	53.70	55.20	57.20	57.20	59.20	60.45	59.20	57.95	56.85	59.20
1922	41.60	42.10	43.00	43.85	44.70	46.60	45.55	45.20	47.85	52.20	51.20	51.20
1921	64.10	64.10	64.10	64.10	64.10	51.50	47.60	44.35	42.90	42.60	42.60	42.60
1920	67.55	71.30	72.80	74.40	76.80	76.80	76.80	76.80	81.50	83.10	83.10	83.10
1919	64.30	61.80	60.55	56.80	54.80	51.80	52.60	54.80	55.80	59.80	59.80	63.80
1918	54.30	54.30	54.30	54.30	55.50	60.80	62.05	61.85	61.80	66.80	66.80	66.80
1917	41.00	41.50	43.70	52.50	55.50	60.75	65.50	65.50	65.50	57.75	52.10	53.50
1916	29.20	29.50	29.50	30.50	30.50	30.50	30.50	30.50	31.00	31.50	35.00	40.50
1915	23.40	23.00	23.00	23.00	23.00	23.00	24.00	24.00	24.70	25.75	26.90	27.90

Cast Iron Pipe, Birmingham, 1915-1932

6-inch and Larger

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1932	$33.00	$32.20	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00
1931	37.00	37.00	36.50	35.00	35.00	35.00	35.00	35.00	33.00	33.00	33.00	33.00
1930	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
1929	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
1928	29.00	29.00	28.50	30.00	33.50	31.00	32.50	34.00	34.00	35.00	36.40	37.00
1927	36.00	36.00	36.50	36.00	36.50	34.80	34.00	30.75	29.80	28.75	29.00	29.00
1926	42.00	41.25	40.24	40.00	50.00	40.00	40.00	40.00	39.40	40.00	39.00	38.00
1925	40.00	40.00	40.00	39.60	38.50	40.00	40.00	41.00	41.00	41.75	42.00	42.00
1924	46.80	47.50	48.00	48.00	48.00	48.00	47.00	47.00	45.00	44.40	46.00	40.00
1923	43.00	45.00	45.50	46.75	49.00	49.00	49.00	49.00	49.00	49.00	49.00	51.00
1922	35.00	34.00	33.00	34.15	34.70	37.00	37.00	37.30	40.00	43.00	43.00	43.00
1921	55.00	55.00	55.00	55.00	55.00	42.50	40.00	39.50	38.00	36.50	32.50	35.00
1920	60.00	64.50	66.00	67.00	70.00	70.00	70.00	70.00	72.40	74.00	74.00	74.00
1919	58.75	55.00	54.50	53.00	52.00	48.00	48.00	48.00	48.00	50.00	53.00	56.70
1918	49.00	49.00	49.00	49.00	50.20	55.00	55.00	55.00	55.00	60.00	60.00	60.05
1917	36.00	36.00	37.40	42.40	47.20	55.00	55.00	55.00	55.75	47.25	45.00	46.00
1916	24.00	24.50	25.00	25.00	25.00	25.00	25.00	25.50	25.50	25.50	28.40	35.00
1915	19.50	19.50	19.50	19.50	19.25	18.65	19.00	19.00	19.40	20.75	21.90	22.65

Steel Ingot Production

Compiled by American Iron and Steel Institute

Gross Tons

	1923		1924		1925		1926		†1927	
	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.
January	3,841,095	142,263	3,649,913	135,182	4,193,281	155,307	4,132,210	158,931	3,789,874	145,764
February	3,471,843	144,660	3,826,246	153,050	3,752,352	156,348	3,785,051	157,710	3,812,046	158,835
March	4,066,680	150,618	4,206,699	161,796	4,194,340	161,321	4,468,617	165,504	4,535,272	167,973
April	3,963,736	158,549	3,348,466	128,787	3,583,676	137,834	4,105,799	157,915	4,127,335	158,744
May	4,216,355	156,161	2,640,034	97,779	3,454,971	132,883	3,927,979	151,076	4,047,251	155,663
June	3,767,256	144,894	2,065,676	82,627	3,204,451	123,248	3,734,153	143,621	3,495,609	134,446
July	3,531,458	141,258	1,877,789	72,223	3,084,472	118,634	3,634,993	139,807	3,204,135	128,165
August	3,695,788	136,881	2,552,891	98,188	3,420,998	131,577	3,986,966	153,345	3,498,549	129,576
September	3,356,776	134,271	2,827,025	108,755	3,489,565	134,214	6,913,383	150,515	3,268,881	125,726
October	3,577,091	132,485	3,125,418	115,756	3,888,814	144,030	4,074,544	156,713	3,316,292	127,550
November	3,134,321	120,551	3,121,149	124,846	3,902,900	156,116	3,705,744	142,529	3,127,015	120,270
December	2,863,266	114,531	3,569,251	137,279	3,970,918	152,728	3,466,766	133,337	3,175,484	122,134
Total	43,485,665	*139,825	36,811,157	*117,984	44,140,738	*141,932	46,936,205	*150,920	43,397,743	*139,543

	†1928		†1929		†1930		†1931		†1932	
	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.	Total	Daily Av.
January	3,990,902	153,496	4,500,131	166,672	3,778,235	139,935	2,512,140	93,042	1,459,450	56,133
February	4,043,457	161,738	4,328,713	180,363	4,035,111	168,130	2,547,027	106,126	1,457,710	58,308
March	4,507,217	166,934	5,068,176	194,930	4,254,331	163,628	3,054,339	117,475	1,409,054	52,187
April	4,305,382	172,215	4,950,053	190,387	4,109,492	158,057	2,766,959	106,421	1,238,250	47,625
May	4,207,212	155,823	5,286,246	195,787	3,982,915	147,515	2,551,633	98,140	1,106,030	42,540
June	3,743,903	143,996	4,902,955	196,118	3,418,535	136,741	2,127,762	81,837	897,275	34,511
July	3,805,598	152,224	4,850,583	186,561	2,922,220	112,393	1,887,580	72,599	792,533	31,701
August	4,178,610	154,763	4,939,086	182,929	3,060,763	117,722	1,716,829	66,032	832,402	30,830
September	4,147,893	165,916	4,527,887	181,115	2,840,379	109,245	1,545,411	59,439	975,061	37,502
October	4,649,968	172,221	4,534,326	167,938	2,692,539	99,724	1,590,180	58,896	1,068,550	41,098
November	4,266,835	164,109	3,521,111	135,427	2,212,220	88,489	1,591,644	63,666	1,014,794	39,031
December	4,018,208	160,728	2,903,012	116,120	1,979,547	76,136	1,301,211	50,047	.....	.....
Total	49,865,185	*160,338	54,312,279	*174,638	39,286,287	*126,322	‡25,192,715	*81,006	‡12,251,109	*42,836

*Average. †Beginning with 1927, the Institute excludes crucible and electric ingots, which totaled 675,123 tons in 1927, 810,029 tons in 1928, 958,076 tons in 1929, 614,852 tons in 1930, and 412,489 tons in 1931. ‡Eleven months.

Pig Iron Production

IN GROSS TONS

Annual Statistics of Coke and Anthracite Pig Iron Compiled by American Iron and Steel Institute, Monthly Statistics, 1912 to date, by STEEL (Iron Trade Review prior to July 1, 1930)

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1856....	457,738	1870....	1,339,284	1884....	3,670,567	1898....	11,477,184
1857....	417,711	1871....	1,363,043	1885....	3,687,522	1899....	13,335,937
1858....	374,804	1872....	2,101,760	1886....	5,273,010	1900....	13,404,760
1859....	496,952	1873....	2,045,231	1887....	5,900,914	1901....	15,494,913
1860....	572,713	1874....	1,886,479	1888....	5,955,105	1902....	17,431,138
1861....	478,809	1875....	1,656,777	1889....	7,028,374	1903....	17,503,568
1862....	536,609	1876....	1,593,382	1890....	8,574,558	1904....	16,157,504
1863....	656,785	1877....	1,782,805	1891....	7,702,906	1905....	22,639,452
1864....	798,342	1878....	2,039,252	1892....	8,619,379	1906....	24,874,184
1865....	597,536	1879....	2,151,431	1893....	6,737,713	1907....	25,343,964
1866....	918,717	1880....	3,355,228	1894....	6,434,966	1908....	15,686,872
1867....	997,576	1881....	3,573,863	1895....	9,220,967	1909....	25,419,468
1868....	1,100,893	1882....	4,000,193	1896....	8,311,833	1910....	26,907,060
1869....	1,361,153	1883....	4,085,041	1897....	9,397,469	1911....	23,370,871

	—Stacks— No.	In	—Output— Total	Av. Daily
			1912	
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	*80,124

	—Stacks— No.	In	—Output— Total	Av. Daily
			1913	
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	*83,980

	—Stacks— No.	In	—Output— Total	Av. Daily
			1914	
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	*62,934

	—Stacks— No.	In	—Output— Total	Av. Daily
			1915	
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	*81,022

	—Stacks— No.	In	—Output— Total	Av. Daily
			1916	
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	*106,609

	—Stacks— No.	In	—Output— Total	Av. Daily
			1917	
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	*104,561

	—Stacks— No.	In	—Output— Total	Av. Daily
			1918	
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	438	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	*105,308

	—Stacks— No.	In	—Output— Total	Av. Daily
			1919	
January	435	330	3,306,279	106,654
February	435	311	2,943 347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	*83,777

	—Stacks— No.	In	—Output— Total	Av. Daily
			1920	
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	*99,456

	—Stacks— No.	In	—Output— Total	Av. Daily
			1921	
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	*45,223

	—Stacks— No.	In	—Output— Total	Av. Daily
			1922	
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	*73,563

	—Stacks— No.	In	—Output— Total	Av. Daily
			1923	
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,546,308	118,210
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,646	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	*109,659

	—Stacks— No.	In	—Output— Total	Av. Daily
			1924	
January	414	248	3,015,480	97,273
February	414	263	3,073,619	105,987
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,783,457	57,531
August	411	150	1,882,986	60,741
September	411	174	2,053,617	68,454
October	411	182	2,461,727	79,410
November	411	204	2,514,979	83,832
December	411	229	2,956,389	95,367
Total			31,076,572	*84,908

	—Stacks— No.	In	—Output— Total	Av. Daily
			1925	
January	411	251	3,372,207	108,781
February	411	256	3,214,067	114,788
March	410	246	3,571,422	115,207
April	409	221	3,211,235	107,041
May	405	196	2,933,907	94,642
June	399	191	2,679,045	89,301
July	396	188	2,665,262	85,976
August	391	192	2,707,171	87,328
September	387	200	2,725,885	90,862
October	386	209	3,017,889	97,351
November	385	220	3,023,257	100,775
December	385	234	3,249,057	104,808
Total			36,370,404	*99,645

	—Stacks— No.	In	—Output— Total	Av. Daily
			1926	
January	385	225	3,319,789	107,089
February	382	223	2,923,850	104,423
March	377	235	3,458,171	111,554
April	376	237	3,438,805	114,627
May	376	229	3,477,820	112,187
June	372	220	3,232,478	107,749
July	372	217	3,224,663	104,021
August	372	215	3,200,723	103,249
September	372	216	3,163,269	105,442
October	374	218	3,334,206	107,555
November	375	216	3,237,992	107,933
December	369	203	3,089,175	99,651
Total			39,100,941	*107,126

	—Stacks— No.	In	—Output— Total	Av. Daily
			1927	
January	369	210	3,101,346	100,043
February	369	217	2,940,604	105,021
March	365	223	3,482,107	112,326
April	364	221	3,424,377	114,146
May	363	211	3,391,067	109,388
June	362	198	3,089,726	102,991
July	362	190	2,954,625	95,311
August	362	189	2,950,674	95,183
September	362	181	2,782,500	92,750
October	361	174	2,812,015	90,712
November	359	171	2,661,863	88,728
December	354	169	2,698,208	87,039
Total			36,289,112	*99,422

	—Stacks— No.	In	—Output— Total	Av. Daily
			1928	
January	353	184	2,855,515	92,113
February	353	186	2,898,668	99,954
March	350	197	3,199,175	103,199
April	349	195	3,181,975	106,066
May	345	199	3,292,790	106,219
June	343	189	3,082,340	102,745
July	342	185	3,072,711	99,120
August	340	183	3,136,995	101,193
September	340	194	3,063,593	102,120
October	338	196	3,373,539	108,824
November	337	194	3,304,656	110,155
December	335	198	3,369,784	108,702
Total			37,831,741	*103,365

	—Stacks— No.	In	—Output— Total	Av. Daily
			1929	
January	328	202	3,433,028	110,742
February	326	208	3,218,376	114,942
March	326	213	3,709,518	119,662
April	326	216	3,663,167	122,106
May	325	220	3,898,344	125,753
June	325	220	3,715,104	123,837
July	325	217	3,782,511	122,016
August	325	209	3,746,198	120,845
September	323	204	3,496,454	116,548
October	318	203	3,588,146	115,747
November	317	176	3,182,420	106,081
December	316	156	2,836,917	91,513
Total			42,270,183	*115.808

	—Stacks— No.	In	—Output— Total	Av. Daily
			1930	
January	314	173	2,838,751	91,573
February	314	180	2,845,937	101,640
March	314	184	3,252,822	104,930
April	314	182	3,191,119	106,371
May	314	180	3,241,477	104,564
June	312	162	2,934,508	97,817
July	312	144	2,638,441	85,110
August	312	137	2,525,105	81,455
September	310	126	2,276,781	75,893
October	310	111	2,165,374	69,851
November	310	107	1,865,458	62,182
December	310	95	1,665,715	53,732
Total			31,441,488	*86,141

	—Stacks— No.	In	—Output— Total	Av. Daily
			1931	
January	309	102	1,715,443	55,337
February	307	109	1,711,192	61,114
March	307	116	2,028,906	65,448
April	307	113	2,009,582	66,986
May	307	105	1,995,001	64,355
June	303	91	1,637,998	54,599
July	303	82	1,462,270	47,170
August	303	75	1,279,205	41,264
September	303	74	1,168,436	38,947
October	303	69	1,172,781	37,831
November	302	67	1,101,820	36,727
December	301	57	980,377	31,625
Total			18,263,011	*50.035

	—Stacks— No.	In	—Output— Total	Av. Daily
			1932	
January	298	61	971,437	31,336
February	298	64	960,550	33,122
March	298	60	967,015	31,194
April	297	59	855,734	28,524
May	297	54	783,769	25,282
June	297	47	626,015	20,867
July	297	45	570,222	18,394
August	297	41	528,105	17,035
September	295	46	593,640	19,788
October	292	50	644,648	20,795
November	292	51	625,753	20,858
December	...	..	.....	.....
Total			†8,126,798	*24,259

*Average.
†Eleven months.

Composite Market Record

Compiled by STEEL (Iron Trade Review prior to July 1, 1930)

Monthly Averages of Fourteen Iron and Steel Products, 1921-1928

1921	
January	51.98
February	48.81
March	45.37
April	43.84
May	43.32
June	41.87
July	38.14
August	35.99
September	$35.34
October	35.46
November	34.71
December	33.99
Average for year	40.74

1922	
January	33.35
February	32.86
March	32.97
April	34.42
May	36.49
June	36.96
July	37.50
August	39.79
September	43.79
October	43.60
November	42.08
December	40.53
Average for year	37.86

1923	
January	41.17
February	42.61
March	$45.31
April	47.01
May	47.52
June	46.46
July	45.39
August	44.87
September	44.64
October	43.84
November	42.81
December	43.02
Average for year	44.55

1924	
January	43.26
February	43.49
March	43.24
April	42.53
May	41.38
June	40.61
July	39.78
August	39.33
September	39.05
October	38.65
November	39.00
December	$40.21
Average for year	40.86

1925	
January	41.02
February	41.13
March	40.70
April	39.45
May	38.37
June	37.60
July	37.45
August	37.39
September	37.35
October	37.61
November	38.73
December	39.14
Average for year	38.83

1926	
January	39.17
February	38.95
March	38.88
April	38.48
May	$38.22
June	37.69
July	37.68
August	37.61
September	37.76
October	38.08
November	38.43
December	38.22
Average for year	38.26

1927	
January	37.68
February	36.97
March	36.83
April	36.73
May	36.76
June	36.59
July	36.41
August	36.25
September	36.18
October	35.67
November	35.35
December	35.09
Average for year	36.37

1928	
January	$35.27
February	35.62
March	35.81
April	35.67
May	35.54
June	35.30
July	34.91
August	34.96
September	35.19
October	35.53
November	36.02
December	36.22
Average for year	35.50

Weekly and Monthly Averages, 1929-1932

1929	
Jan. 2	$36.25
Jan. 9	36.23
Jan. 16	36.23
Jan. 23	36.25
Jan. 30	36.25
Average for January	36.24
Feb. 6	36.25
Feb. 13	36.25
Feb. 20	36.25
Feb. 27	36.37
Average for February	36.28
Mar. 6	36.37
Mar. 13	36.37
Mar. 20	36.37
Mar. 27	36.57
Average for March	36.42
Apr. 3	36.57
Apr. 10	36.81
Apr. 17	36.82
Apr. 24	37.04
Average for April	36.81
May 1	37.07
May 8	37.07
May 15	37.13
May 22	37.13
May 29	37.10
Average for May	37.10
June 5	37.07
June 12	37.07
June 19	36.96
June 26	36.84
Average for June	36.99
July 3	36.76
July 10	36.72
July 17	36.72
July 24	36.68
July 31	36.68
Average for July	36.71
Aug. 7	36.60
Aug. 14	36.52
Aug. 21	36.52
Aug. 28	36.52
Average for August	36.54
Sept. 4	36.52
Sept. 11	36.52
Sept. 18	36.52
Sept. 25	36.44
Average for September	36.50
Oct. 2	36.36
Oct. 9	36.32
Oct. 16	36.24
Oct. 23	36.16
Oct. 30	36.09
Average for October	36.23
Nov. 6	36.09
Nov. 13	36.09
Nov. 20	35.97
Nov. 27	35.97
Average for November	36.03
Dec. 4	35.97
Dec. 11	35.95
Dec. 18	35.97
Dec. 25	35.89
Average for December	35.95
Average for year	36.48

1930	
Jan. 1	$35.88
Jan. 8	35.72
Jan. 15	35.60
Jan. 22	35.36
Jan. 29	35.24
Average for January	35.56
Feb. 5	35.24
Feb. 12	35.24
Feb. 19	35.24
Feb. 26	35.24
Average for February	35.24
Mar. 5	35.12
Mar. 12	34.94
Mar. 19	34.89
Mar. 26	34.85
Average for March	34.95
Apr. 2	34.57
Apr. 9	34.52
Apr. 16	34.44
Apr. 23	34.40
Apr. 30	34.28
Average for April	34.44
May 7	33.96
May 14	33.84
May 21	33.56
May 28	33.56
Average for May	33.73
June 4	33.64
June 11	33.52
June 18	33.52
June 25	33.44
Average for June	33.53
July 2	33.34
July 9	33.32
July 16	33.18
July 23	33.14
July 30	33.09
Average for July	33.21
Aug. 6	33.08
Aug. 13	33.00
Aug. 20	33.00
Aug. 27	32.88
Average for August	32.99
Sept. 3	32.78
Sept. 10	32.68
Sept. 17	32.64
Sept. 24	32.56
Average for September	32.65
Oct. 1	32.52
Oct. 8	32.32
Oct. 15	32.24
Oct. 22	32.14
Oct. 29	32.06
Average for October	32.26
Nov. 5	31.98
Nov. 12	31.98
Nov. 19	31.86
Nov. 26	31.86
Average for November	31.92
Dec. 3	31.84
Dec. 10	31.84
Dec. 17	31.68
Dec. 24	31.66
Dec. 31	31.66
Average for December	31.74
Average for year	33.52

1931	
Jan. 7	$31.66
Jan. 14	31.73
Jan. 21	31.73
Jan. 28	31.73
Average for January	31.71
Feb. 4	31.69
Feb. 11	31.69
Feb. 18	31.61
Feb. 25	31.61
Average for February	31.65
Mar. 4	31.61
Mar. 11	31.61
Mar. 18	31.71
Mar. 25	31.71
Average for March	31.66
Apr. 1	31.67
Apr. 8	31.67
Apr. 15	31.59
Apr. 22	31.51
Apr. 29	31.49
Average for April	31.59
May 6	31.40
May 13	31.37
May 20	31.37
May 27	31.33
Average for May	31.37
June 3	31.03
June 10	31.03
June 17	31.03
June 24	30.99
Average for June	31.02
July 1	31.11
July 8	31.11
July 15	30.98
July 22	30.98
July 29	31.06
Average for July	31.05
Aug. 5	31.06
Aug. 12	31.06
Aug. 19	31.04
Aug. 26	31.04
Average for August	31.05
Sept. 2	31.04
Sept. 9	31.04
Sept. 16	31.03
Sept. 23	31.02
Sept. 30	31.02
Average for September	31.03
Oct. 3	30.82
Oct. 10	30.78
Oct. 17	30.76
Oct. 24	30.68
Oct. 31	30.64
Average for October	30.74
Nov. 7	30.63
Nov. 14	30.63
Nov. 21	30.63
Nov. 28	30.55
Average for November	30.61
Dec. 5	30.47
Dec. 12	30.36
Dec. 19	30.28
Dec. 26	30.16
Average for December	30.32
Average for year	31.15

1932	
Jan. 2	$29.96
Jan. 9	29.96
Jan. 16	30.08
Jan. 23	30.00
Jan. 30	29.92
Average for January	29.98
Feb. 6	29.60
Feb. 13	29.57
Feb. 20	29.53
Feb. 27	29.53
Average for February	29.56
Mar. 5	29.53
Mar. 12	29.55
Mar. 19	29.57
Mar. 26	29.81
Average for March	29.61
Apr. 2	29.81
Apr. 9	29.74
Apr. 16	29.74
Apr. 23	29.74
Apr. 30	29.70
Average for April	29.75
May 7	29.68
May 14	29.64
May 21	29.58
May 28	29.57
Average for May	29.62
June 4	29.56
June 11	29.56
June 18	29.52
June 25	29.52
Average for June	29.54
July 2	29.52
July 9	29.48
July 16	29.46
July 23	29.46
July 30	29.46
Average for July	29.47
Aug. 6	29.46
Aug. 13	29.34
Aug. 20	29.26
Aug. 27	29.24
Average for August	29.32
Sept. 3	29.32
Sept. 10	29.32
Sept. 17	29.32
Sept. 24	29.32
Average for September	29.32
Oct. 1	29.32
Oct. 8	29.30
Oct. 15	29.33
Oct. 22	29.32
Oct. 29	29.32
Average for October	29.32
Nov. 5	29.32
Nov. 12	29.32
Nov. 19	28.92
Nov. 26	28.91
Average for November	29.12
Dec. 3	28.91
Dec. 10	28.91
Dec. 17	28.91
Dec. 24	28.91

Auto Needs Supply Rebound to Steel Rate

Industry Back to Mid-December Level, and Confident—Standard of New Jersey Buys Tin Plate—Scrap to Japan Lifts November Exports

SHAKING off its holiday encumbrance, the iron and steel industry was scheduled to start the new year at an operating rate of about 14 per cent, regaining the pace of mid-December and possibly recovering to an average of 15 per cent for the week ended Jan. 7.

There is additional enccuragement, as the year opens, from the indication that, although for a few days around Christmas the steel rate broke through the previous 1932 low of 12 per cent, December as a month was not pulled down to the alltime low of August.

The industry embarks upon the first quarter confident that it is on the threshold of a period of moderate recovery. It is mindful that backlogs have never been so thin, and that January will lack the sustaining rail tonnage which usually gets the month away to a good start.

Yet there is an underlying sentiment that principal consumers of iron and steel certainly will take no less than in 1932 and probably will specify more. And due to wage reductions and other economies, and concentration of production in low-cost plants, unit costs are less than a year ago.

Due largely to automotive releases, the Cleveland district opens the week at 29 per cent, highest for the country. Pittsburgh is scheduled to expand from 10½ per cent to about 14, Birmingham will rise from 10 per cent to 15-18, while eastern Pennsylvania will probably lift a point or two above the current 8-9 per cent rate. For the latter district operations of 15 to 16 per cent are forecast later in the month.

Only from the automobile industry have actual releases of material the past few days been encouraging, and this business centers in Chevrolet, Chrysler and Ford. Officially, the new 2.20c, Pittsburgh, price on No. 24 hot rolled annealed sheets, an advance of $2, is effective.

Tin plate mills have stepped up to an average operation of 40 per cent. The Standard Oil Co. of New Jersey has placed its 1933 contract requirements, approximating 6500 tons.

Largest rail inquiry before mills is that of the New York board of transportation for 6680 tons of standard and 400 tons of guard rails, with commensurate fastenings. Other carriers in the market for fastenings are the Santa Fe, Boston & Maine and Atlantic Coast Line.

A buyer of basic pig iron has closed on 4000 to 5000 tons at Pittsburgh for January delivery, and probably will repeat for February. Chicago furnaces expect further business in January from small foundries. St. Louis reports improved demand for castings for brewery equipment.

Bar iron wage rates for January and February are reduced from $9.30 to $9.05 per ton, sensitive to the weaker market. Effective Jan. 1 the H. C. Frick Coke Co. reduced wages 15 per cent at its six coal mines being operated in the Connellsville district.

Structural steel awards for the week ended Dec. 30 totaled 9533 tons, about half the weekly average for 1932. Bridges in New York state will take 5000 tons. Concrete bar inquiry is featured by 5000 tons for the Golden Gate bridge approaches at San Francisco and 3000 tons for Illinois highway work.

Due entirely to increased shipment of scrap, principally to Japan, exports of iron and steel rose 14,815 tons, to 56,041 tons in November. Imports increased only 1231 tons, to 34,924 tons, thus enabling November to improve the favorable balance. Canada and Japan in November almost doubled their October purchases of iron and steel from the United States.

The $2 rise in No. 24 hot rolled annealed sheets puts the iron and steel composite of STEEL up 8 cents this week to $28.99 and the finished steel composite up 20 cents to $46.90. The steelworks scrap composite is unchanged at $6.29.

Composite Market Averages

	Dec. 31	Dec. 24	One Month Ago Nov., 1932	Three Months Ago Sept., 1932	One Year Ago Dec., 1931	Ten Years Ago Dec., 1922
Iron and Steel Composite	$28.99	$28.91	$29.12	$29.32	$30.32	$40.53
Finished Steel Composite	46.90	46.70	47.20	47.50	47.74	58.39
Steelworks Scrap Composite	6.29	6.29	6.87	7.04	8.16	17.28

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Dec. 31 1932	Nov. 1932	Sept. 1932	Dec. 1931
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	17.51
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.75	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	17.51
No. 2 foundry, Chicago	15.50	15.50	15.50	16.60
*Southern No. 2, Birmingham	11.00	11.00	11.00	12.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.95	14.26	16.01
Malleable, valley	14.50	14.50	14.50	16.10
Malleable, Chicago	15.50	15.50	15.50	16.60
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	20.79
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.88
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	84.79

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.80	2.00	2.30
Connellsville, foundry, ovens	2.50	2.65	2.75	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	28.25
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	28.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	29.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00

	Dec. 31 1932	Nov. 1932	Sept. 1932	Dec. 1931
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.60
Steel bars, Philadelphia	1.91	1.91	1.91	1.89
Iron bars, Chicago	1.65	1.65	1.65	1.60
Shapes, Pittsburgh	1.50	1.60	1.60	1.50
Shapes, Philadelphia	1.75	1.75	1.75	1.695
Shapes, Chicago	1.70	1.70	1.70	1.60
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Philadelphia	1.69½	1.77	1.79½	1.735
Tank plates, Chicago	1.70	1.70	1.70	1.60
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.70	1.85
Sheets, No. 24, hot ann., Pitts.	2.20	2.10	2.10	2.40
Sheets, No. 24 galvan., Pitts.	2.85	2.85	2.75	2.90
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	2.00
Sheets, No. 24 hot ann., Chi.	2.25	2.25	2.25	2.55
Sheets, No. 24 galvan., Chi.	2.90	2.90	2.90	3.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.50	4.75	4.75
Scrap				
Heavy melting steel, Pitts.	$8.50	9.15	9.50	10.25
Heavy melting steel, eastern Pa.	6.50	7.25	7.25	7.60
Heavy melting steel, Chicago	5.25	5.60	5.75	7.50
No. 1 wrought, eastern Pa.	6.50	7.25	7.25	9.50
No. 1 wrought, Chicago	5.00	5.00	5.00	7.45
Rails for rolling, Chicago	8.25	8.25	7.00	10.00

Sheets

Automotive Specifications Only Active Feature of Market—Efforts Made to Hold Price Levels

SHEET PRICES, PAGE 127

Pittsburgh—Aside from automotive tonnage there is little demand for various grades of sheets. Prices continue widely at variance, although published quotations are done on most of the average size orders. Tonnage for early January rolling is small. Bids are expected to be asked soon for license tag stock for Pennsylvania. No. 24 hot rolled annealed sheets now are quoted 2.20c, minimum, in line with the first quarter announcement. Sheet mill operations here last week were interrupted by the holidays.

Boston—Bids close Jan. 10 on approximately 640 tons of sheets for the navy, part of the requirements being for Boston and Portsmouth, N. H., although the bulk of the tonnage is for other points. Included are black, galvanized, and a small tonnage of corrugated galvanized. Sheet demand is light.

New York—The market here is quiet, and prices are easy.

Philadelphia—Moderate buying of sheets by an autobody builder here features an otherwise quiet market. Improvement in general demand is expected. Prices are unchanged, pending a test. Fable & Co. Inc., Philadelphia, have been awarded 10,000 sheets of long terne plate for the Frankford, Pa., arsenal at 3.999c a pound, delivered. Bids are in on 17,342 sheets of tin plate for the Edgewood, Md., arsenal.

Youngstown, O.—The Youngstown Sheet & Tube Co. has booked 168 tons of galvanized corrugated steel sheets for the navy, delivery at New York, Boston or Philadelphia, for shipment to Cavite, P. I., at $9727.25, f.a.s. vessel, bids Nov. 29. Sheets are 27½ inches wide, 6595 being 96 inches long and 3992 being 120 inches long.

Cleveland—Automotive sheet specifications are sustaining mill operations at their pre-holiday levels, and largely because of them steel ingot production here was stepped up the latter part of last week to a point slightly above that prevailing before Christmas. Releases are conservative, but consistent, and indicate that mill operations on automotive sheets will continue during the current week at around 35 per cent. Buying from other manufacturing industries is slow, though some inquiries are expected shortly from refrigerator companies.

A valley mill interest has followed in reaffirming prices for first quarter, except raising black sheets from 2.10c to 2.20c, and naming 2.85c for galvanized.

Cincinnati—Mill operations in this district are largely dependent on automotive demand, which picked up moderately in the past week. Consumers generally hesitate to contract for future needs.

Chicago—Sheet demand was spotty during the week, and although some business has been received for future shipments such tonnage is light. Operations are irregular, backlogs being insignificant and insufficient to provide schedules for more than a few days ahead. Some seasonal improvement in specifications from miscellaneous consumers is anticipated this month.

San Francisco—Bids close Jan. 17 on 14,000 square feet of galvanized, expanded steel metal, the size of the sheet to be 6 by 8 feet. For Boston, on the same date, quotations will be taken on 960 square feet.

Wholesale price index of metals and metal products, computed by the bureau of labor statistics, Washington, eased off fractionally from 79.4 to 79.3 in the week ended Dec. 17. The week preceding, ended Dec. 10, it was 79.5. In this index, 1926 equals 100.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, delivered	1.70c
New York, delivered	1.90c
Birmingham, base	1.70c
Philadelphia, delivered	1.86c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, delivered	2.01c
New York, delivered	2.05c
St. Louis, delivered	2.04c
Birmingham, base	1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED No. 24

*Pittsburgh, base	2.20c
Gary, Ind. Harbor, base	2.20c to 2.30c
Chicago, delivered	2.25c to 2.35c
New York, delivered	2.45c to 2.55c
Philadelphia, delivered	2.41c to 2.51c
Birmingham, base	2.35c
St. Louis, delivered	2.54c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.28½c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, delivered	3.00c
Philadelphia, delivered	3.16c
New York, delivered	3.20c
Birmingham, base	3.00c
St. Louis, delivered	3.19c
San Francisco, c.i.f.	3.50c

AUTOBODY No. 20

Pittsburgh, base	2.55c to 2.65c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, delivered	2.67½c

HEAVY COLD ROLLED No. 10

Pittsburgh, base	2.00c
Gary, Ind. Harbor, base	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.31c
New York, delivered	2.35c

COLD ROLLED No. 20

Pittsburgh, base	2.50c
Gary, Ind. Harbor, base	2.60c
Chicago, delivered	2.65c
Philadelphia, delivered	2.81c
New York, delivered	2.85c

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

Polished staples	2.65c
Galvanized staples	2.90c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing (9-11 gage)	$55.00
(12½ gage and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.69½c to 1.79½c
New York, delivered	1.80c to 1.90c
Boston, delivered	1.92c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
Coatesville, Pa., base	1.60c to 1.70c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.50c to 1.60c
Philadelphia, delivered	1.75c
New York, delivered	1.87c
Boston, delivered	2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
Eastern mills	1.35c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts. billet cut lengths	1.65c
Pitts., stock lengths mill	1.50c
Chicago, billet	1.50c to 1.60c
Chicago, rail steel	1.20c to 1.30c
Philadelphia, cut lengths	1.76c to 1.86c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base Pittsburgh for one size, shape and grade for shipment at one time to one destination

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
Long ternes, 24 unassorted	2.80

Gary, Ind., base 10 cents higher

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base, 2.45c to 2.65c. Differentials to various classes of consumers

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo. 1.25-1.75 Ni.
2000	0.25	1.05
2100	0.55	5100 .80 - 1.10 Cr. 0.45
2500	1.50	5100 Cr.
2500	2.25	spring 0.20
3100	0.55	6100 bars 1.20
3200	1.35	6100 Spring 0.95
3300	3.30	Cr., Ni., Van. 1.50
3400	3.20	Carbon van. 0.95
4100 .15 to .25 Mo	0.50	9250 (flats) 0.25 9250 (rds., sq.) 0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c to 1.81c
Do., del. New York	1.80c to 1.85c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Cold roll, strip, Pitts., Cleve.	2.00c
Worcester, 3 tons or over	2.20c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleveland	70, 10 and 5 off
Washers, c.l., Pitts. dist.	$6.50 to 6.75 off
Do., Chicago district	7.00 to 7.50 off

Rails, Track Material

Standard rails mill	$40.00
Relaying rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	23.00 to 25.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pittsburgh	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-25 off
Upset 1 in. diam. and smaller 80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller ..... 75-10-10 off
Headless set screws ..... 75-10 off
Upset, larger than 1 in. ..... 75-10 off

Cut Nails, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Steel sheet piling, Pitts.	1.90c

Bars

Automotive Needs Give Most Present Support to Market as Other Consuming Lines Lag

BAR PRICES, PAGE 127

Chicago—Soft steel bar demand has been well maintained, principally as a result of steady volume of business for automotive requirements. December shipments were in excess of expectations and some improvement is anticipated from miscellaneous consumers this month. Automotive demand, however, is expected to be less active from some interests, although Ford requirements may offset the decrease in other directions. Little improvement is in prospect in purchases by farm implement manufacturers. Forward buying generally is limited to small lots with the market continuing 1.70c, Chicago.

Boston—Although no immediate improvement in commercial steel bar demand is evident, sellers are hopeful for a better volume during the year as consumers' stock in most instances are depleted. Prices are unchanged at 1.60c, Pittsburgh.

New York—With most material for delivery at Brooklyn, N. Y., and Philadelphia, the navy closes bids on 170,900 pounds of bar rivet steel, also 2635 pounds of polished drill-rod carbon tool steel for Philadelphia.

Philadelphia — Commercial steel bars are in an easy market, with prices untested at 1.60c, Pittsburgh.

Pittsburgh—The largest bar mill here operated four open hearths and finishing capacity through the Christmas holidays until Dec. 28 but did not resume later in the week, rush orders for crankshafts from a Detroit account being the cause of the holiday schedule. One bar mill here booked 600 tons in two reinforcing bar jobs last week. Prices continue unchanged, 1.60c being the general market for merchant steel bars, and alloy steel bars being quoted 2.45c to 2.65c, mill.

Cleveland—Blanket contracts for first quarter have been closed between many consumers and their regular sources of supply on a basis of 1.65c, Cleveland, for commercial steel bars. Specifications during the week were extremely light from all sources, including automotive and railroads.

St. Louis—Prices of steel bars are unchanged for first quarter but no large orders for that delivery have been booked.

Books Navy Yard Tools

Chicago Pneumatic Tool Co., New York, has been awarded a contract for reamers and drills for the Brooklyn, N. Y., navy yard, bids Nov. 1, at $6450.

Buys 6500 Tons Tin Plate; Mill Operations Improve

Tin Plate Prices, Page 127

Pittsburgh—Standard Oil Co. of New Jersey has placed 1933 contract requirements amounting to approximately 6500 tons of tin plate, divided among several producers. Weirton Steel Co. reopened its Steubenville, O., plant, Dec. 27 on tin plate production. Average of tin mill operations is better than a week ago, being 40 per cent since the Christmas holidays. Several other contracts were placed during the past week. The $4.25 price is firm.

New York—Leading canmakers have not yet contracted, but are releasing specifications for February.

Cold-Finished Is Dull

Cold Finished Prices, Page 127

Pittsburgh — Cold-finished bar mills anticipate better specifications from the automotive field for this month after a decidedly dull state of trade between the holidays last week. Quotations are based on 1.70c, Pittsburgh.

Plates

Markets Reflect Holiday Influences—Oil Companies Inquiring for First Half Requirements

PLATE PRICES, PAGE 127

New York—Oil company requirements are sustaining plate demand. Standard Oil Co. of New Jersey is inquiring for first half requirements, most sellers quoting only for first quarter. Several railroads have opened bids for quarterly plate requirements. Bids received by the New York Central are: Granite City Steel Co., Granite City, Ill., 1.50c mill, for ¼-inch; 1.70c for 3/16-inch; Central Iron & Steel Co., Harrisburg, Pa., 1.70c and 1.90c, Harrisburg; Alan Wood Steel Co., Conshohocken, Pa., 1.84c and 2.04c, Newberry Junction, N. Y. Others quoted one price for both thickness as follows: Bethlehem Steel Co., Bethlehem, Pa., 1.7375c, Youngstown, O., and 1.840c, West Seneca, N. Y.; Otis Steel Co., 1.60c, Cleveland; Carnegie Steel Co., 1.72375c, Youngstown, and 1.855c, West Seneca; Illinois Steel Co., 1.60c, Chicago; Youngstown Sheet & Tube Co., 1.60c, Youngstown; Lukens Steel Co., Coatesville, Pa., 1.898c, New York city, or Newberry Junction; Inland Steel Co., 1.60c, Indiana Harbor, Ind.; Jones & Laughlin Steel Corp., 1.72375c, Youngstown, and 1.855c, West Seneca. Corrigan, McKinney Steel Co. bid 1.60c, Cleveland, for the steel bars.

Boston—Plate buying is in small lots, the total being light. Two additional destroyers are expected to be built at the Boston navy yard, taking several hundred tons each, the material to be bought direct by the department in open bidding. The 1.70c, Coatesville, Pa., and 1.60c, Pittsburgh, prices frequently are shaded on fair tonnages.

Philadelphia—Placing of 700 tons of plates for a ferryboat for the Virginia Ferry Corp., Norfolk, Va., centers attention here in the plate market, with bids to be opened Jan. 3. Prices range from 1.60c to 1.70c, base, Coatesville, Pa., for carlots.

Pittsburgh—Lack of river barge work still is noted, and specifications to district plate mills from miscellaneous customers have been lighter the past week. Tank work is slow and no sizable contracts are reported. Generally, 1.60c, Pittsburgh, applies on plates.

Cleveland—Plate consumers show hesitancy in closing for forward requirements, mainly because of the lack of orders for finished products. In the absence of contracts, some platemakers have notified customers that they will be "protected" for the present at 1.60c, base, Pittsburgh. Inquiries and releases during the week were the lightest of the year, reflecting holiday influences.

Chicago—Forward plate buying is lacking and spot orders require only small tonnages. A fair volume of work is in prospect although the outlook for increased purchases by railroads remains poor. Tank awards

are light. Plates continue 1.70c, Chicago.

Contracts Placed

120 tons, repairs to East river bridges, New York, to Seaport Contracting & Supply Co. Inc., New York.

102 tons, including 50 tons for Wapato, Wash., irrigation project and 52 tons for Puget Sound navy yard tunnel, to Valley Iron Works, Yakima, Wash., and Truscon Steel Co., Youngstown, O., respectively.

Contracts Pending

150 tons, standpipe, Hamilton Field, Calif.; Pittsburgh-Des Moines Steel Co., Pittsburgh, low.

Nuts, Bolts, Rivets Slow As Year Makes Turn

Bolt, Nut, Rivet Prices, Page 127

Pittsburgh—Lower prices on small bolts and nuts, new list for which is in effect for first quarter, have tended to forestall forward buying by jobbers. Large carriage and machine bolts remain 75 off list while bolt and nut interests here have a few orders for release early in January they are not booked far ahead. The nominal base of 2.25c continues the price on large rivets.

Chicago—Only small improvement in bolt and nut demand is in early prospect. Automotive specifications are fairly steady, while farm implement manufacturers give no indications of any marked change in January requirements. Jobbers are expected to be heavier buyers, however, following curtailed purchases in December. Little opposition is noted to contracting at 75 off for bolts and nuts, and 2.35c, Chicago, for structural rivets. Most first quarter contracts have been signed.

Cleveland — Inventories have checked current releases for nuts, bolts and rivets. Automotive business has held fairly steady; Pontiac is expected to take substantial quantities of nuts and bolts immediately. Rivet tonnage has been light during the week, but is expected to pick up this month, especially from the railroads.

Frick Coke Cuts Wages

The H. C. Frick Coke Co., Uniontown, Pa., as of Jan. 1 reduced wages 15 per cent at the six coal mines it is operating in the Connellsville field. The daily wage for drivers and timbermen was cut from $4.50 to $3.73, with other rates reduced accordingly.

Railroads

Releases on Rail Orders in Fair Volume but New Buying Is Dull —Some Fastenings Placed

TRACK MATERIAL PRICES, PAGE 127

Chicago—Releases against old orders for rails and track fastenings have been well maintained recently, but new business is lacking. Purchases of other steel products for repair work also are light, and the outlook for buying of all steel products by the carriers remains indefinite and not particularly encouraging. Little freight car business is in early prospect, and based on current inquiries rail orders are expected to be light in the near future. Denver & Rio Grande Western railroad has awarded 1500 tons of shapes for bridges in connection with the building of a cut-off in Colorado, but new orders for track material are not looked for. Atchison, Topeka & Santa Fe railroad is expected to close shortly on 2500 to 3000 tons of fastenings to accompany its recent rail order. Northern Pacific has placed 150,000 tie plates, 930 tons, with the Pacific Coast Steel Corp., Seattle.

New York—Board of transportation will open bids Jan. 13 on 6680 tons of standard steel rails 400 tons of guard rails, also tie plates, splice bars and bolts. New York Central is making a canvass of its rail requirements but an inquiry is not expected much before February. Domestic freight car awards for December were 50, making the total 1739 for the year, according to preliminary estimates. This is the lightest year on record. Inquiry for railroad material is negligible.

Pittsburgh—Prices have generally been submitted to leading railroads for first quarter miscellaneous steel needs, although activity otherwise in the railroad steel materials market was dormant last week. Few, if any, specifications for early January shipment are being issued for track materials and fastenings or plain material by leading railroads. Chesapeake & Ohio railroad, after releasing 6000 tons to the Carnegie Steel Co. here recently, is engaged in its program of laying 15,000 tons of rails, which it started recently. The market on spikes, tie plates and rails continues untested. Award is expected this week on supplies of 5000 kegs of spikes each for the Boston & Maine and the Atlantic Coast Line railroads.

Electric Boat Co., Groton, Conn., is low on 12 air compressors and spares for the navy at $60,675, delivered, bids Dec. 13.

Wire Shows Fair Gain But Outlook Is Dull

Wire Prices, Page 127

Chicago—Orders showed a moderate improvement during the past week in contrast to the quiet usually prevailing during the last month of the year. Orders for future requirements are light, however, and only a moderate improvement is looked for in January shipments. Automotive requirements have been fairly steady, but little additional improvement is regarded in prospect. Quiet demand from jobbers serving agricultural districts continues. The market is steady on new business at $2 for carload lots of wire nails, and 2.25c for plain wire.

Worcester, Mass.—Wire demand has slowed but recovery is expected in several directions early in the year, notably from jobbers. Prices on plain and spring wire are firm, the former at 2.30c, Worcester.

New York—Closing Jan. 17, the navy is inquiring for 125,050 square feet of wire cloth, including 100,050 square feet of copper cloth, type A, 18 meshes to the inch with diameter of wire 0.010-inch in widths from 24 to 48-inches. The inquiry also calls for 22,100 square feet of steel wire cloth, galvanized, 36-inches wide and 2900 square feet of brass wire cloth. A good part of this material is for Brooklyn, N. Y., and Philadelphia, but delivery is also asked for several other points on both the east and west coasts.

Pittsburgh—Wire drawing departments in most mills were closed last week and light mails brought few orders. Plain manufacturing wire is 2.20c, Pittsburgh, and the nail price schedule is unchanged.

Birmingham, Ala.—Wire and wire products are reported in somewhat better demand.

Climax Molybdenum Co., Climax, Colo., has added 25 men to its working force and will increase its production from 125,000 pounds per month to 150,000 pounds. This is due to increased orders. H. L. Brown is manager of its Denver office.

Structural Shapes

Awards Thin Out in Closing Week of the Year—Large Tonnages Still Pending in Several States—5000 Up for Highway Bridges for Early Action in New York

STRUCTURAL SHAPE PRICES, PAGE 127

New York—American Bridge Co., Pittsburgh, is low on 2173 tons of shapes for the Rutherford-Secaucus, bridge, Hackensack river. Jones & Laughlin Steel Corp., Pittsburgh, booked 1260 tons for a New York Central viaduct. Bids for more New York state bridges go in Jan. 6, pending tonnage for such work topping 5000 tons. An encouraging feature is the release of moneys certified for payment to contractors and suppliers of materials for New York subways under construction, payment and work having been held up in many instances.

Boston—Structural awards are light with an estimated 2000 tons, including piling, active. Architects and engineer for the parcel post building have been named, the project taking several thousand tons. The leading outside competitor, active in this district, is reported to have taken 16,000 tons in New England during the past year. More plain material is reported to have gone closer to 1.50c than 1.60c.

Philadelphia—Public bridge work leads in demand for structural shapes. Bids were taken during the week on projects requiring about 2300 tons, and awards were made on about 700 tons. Plain material generally is 1.70c, base nearest mill.

Pittsburgh—Erection of a high level bridge across the Allegheny river atop the new Aspinwall dam has been abandoned by county engineers, and county commissioners are still seeking means to finance the high level bridge over the Monongahela river at Homestead, Pa., estimated to cost $3,000,000. Shutrump & Sons Co., Youngstown, O., probably will be awarded the general contract for the 400-ton Rome, N. Y., state building and the 300-ton Binghampton, N. Y., armory. American Bridge Co. here has definitely been awarded the contract to fabricate the 20,000-ton New Orleans belt line railroad bridge span. Shapes are easy at 1.50c to 1.60c.

Cleveland—Some inquiries for structural shapes for railroad bridges and repairs have been received here. Fabricators are figuring on a number of small private jobs. General contract awards were made by the state Dec. 23 on bridges requiring approximately 300 tons of shapes.

Chicago—Structural awards are headed by 1500 tons for bridges for the Denver & Rio Grand Western railroad, other orders consisting of small lots for highway bridges and other public construction. New inquiry is light with private work conspicuously lacking.

Contracts Placed

1500 tons, bridges, Denver & Rio Grande Western railroad, to American Bridge Co., Pittsburgh.

1260 viaduct, New York Central railroad, Bethune and Banks streets, west side, Manhattan (New York), to Jones & Laughlin Steel Corp., Pittsburgh; John Lowry Inc., contractor.

1250 tons, state bridge, project 787-B, Choctawhatchee river, Washington and Walton counties, Florida, to McClintic-Marshall Corp., Bethlehem, Pa.; G. D. Auchter Co., Jacksonville, Fla., general contractor.

720 tons, highway bridge, Dubois-Martin counties, Indiana, to Vincennes Bridge Co., Vincennes, Ind.

580 tons, bridge, Sullivan county, New York, to American Bridge Co., Pittsburgh.

560 tons, federal building, Reno, Nev., to American Bridge Co., Pittsburgh; previously reported to Milwaukee Bridge Co.

530 tons, postoffices, Springfield, O., and New Castle, Pa., to Pittsburgh Bridge & Iron Co., Rochester, Pa., through A. W. Kutsche Co., Detroit.

500 tons, highway bridge, Butler county, Missouri, to Stupp Bridge & Iron Co., St. Louis.

265 tons, warehouse, Merchants Refrigerating Co., New York, to Belmont Iron Works, Philadelphia; Barney Ahlers Construction Co., contractors.

255 tons, postoffice, Wilkes Barre, Pa., to American Bridge Co., Pittsburgh.

250 tons, bridge, South Cedar City, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

250 tons, state bridge, Clinton county, Pennsylvania, to Lackawanna Steel Construction Corp., Buffalo; through J. B. Schultz, Buffalo.

250 tons, Raisch apartment, San Francisco, to Golden Gate Iron Works, San Francisco.

240 tons, state highway bridge, York county, Pennsylvania, to American Bridge Co., Pittsburgh, Pa.

235 tons, state bridge, Northumberland county, Pennsylvania, to McClintic-Marshall Corp., Bethlehem, Pa.

225 tons, state highway bridge, Bryan county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City; Highway Construction Co., Tulsa, Okla., general contractor.

200 tons, highway bridge, Nebraska, to Omaha Steel Works, Omaha, Nebr.

198 tons, highway bridge, New Bethlehem, Pa., to Guibert Steel Co., Pittsburgh.

175 tons, highway bridge, Wapanucka, Okla., to Kansas City Structural Steel Co., Kansas City, Mo.

175 tons, highway bridge, Edina, Mo., to McClintic-Marshall Corp., Bethlehem, Pa.

155 tons, turbine rooms, Passaic and Garfield, N. J., for Julius Forstman & Co., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, pedestrian bridge, World's fair, Chicago, to Duffin Iron Co., Chicago.

110 tons, highway bridges, Polk and Gasper counties, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

110 tons, ammunition buildings, Iona Island, New York, to Belmont Iron Works, Philadelphia; Charles Anderson, contractor.

100 tons, bridge, Whiteley county, Kentucky, to Clinton Bridge Works, Clinton, Iowa.

100 tons, repairs to East river bridges, New York, to Seaport Contracting & Supply Co. Inc., New York.

Awards Compared

	Tons
Awards week ended Dec. 31	**9783**
Awards, week ended Dec. 24	**70,663**
Awards, week ended Dec. 17	**12,174**
Awards this week in 1931	**22,760**
Av. weekly awards, 1931	**34,236**
Av. weekly awards, 1932	**14,285**
Av. weekly awards, Nov.	**11,468**
Awards to date, 1931	**1,734,743**
Awards to date, 1932	**916,130**

Contracts Pending

2173 tons, superstructure, 185-foot double leaf bascule span and superstructures for three flanking spans, about 118 feet each, route 3, section 2, across Hackensack river, Rutherford-Secaucus, N. J.; American Bridge Co., Pittsburgh, low. Work also includes 155 tons of reinforcing bars and 190 tons of trunnions and machinery. Bids Dec. 28.

2000 tons, state hospital buildings, Gowanda, N. Y.; C. F. Haglin & Sons Co., Minneapolis, low for general contract.

700 tons, highway bridges, Oklahoma.

611 tons, state bridge over Colorado river, Grand Junction, Colo.

650 tons, municipal viaduct, Thirtieth street, Philadelphia; bids Dec. 30.

550 tons, state bridge, Lycoming county, Pennsylvania; Spooner Bridge Construction Co., Albany, N. Y., low for general contract.

550 tons, state bridge, Okemah, Okla.; Boardman Co., Oklahoma City, contractor.

460 tons, state bridge, Susquehanna county, Pennsylvania; Spooner Bridge Construction Co., Albany, N. Y., low for general contract.

450 tons, including castings, forgings and reinforcing bars, lock and dam No. 1, Barren river, Greencastle, Ky.; bids by Louisville, Ky., engineers Jan. 27.

400 tons, highway bridges, Iowa City, Iowa.

400 tons, state building, Rome, N. Y.; Shutrump & Sons Co., Youngstown, O., low for general contract.

300 tons, armory, Binghamton, N. Y.; Shutrump & Sons Co., Youngstown, O., low for general contract.

300 tons, postoffice addition, Charlotte, N. C.; bids Jan. 20.

250 tons, Oxford and Pittsfield, Mass.; bids in.

245 tons, five bridges, Mt. Baker National Forest, Whatcom county, Washington; bids by bureau of roads, Portland, Oreg., Jan. 5. Job includes 14 tons of concrete bars.

200 tons, Menominee river interstate bridge, Florence, Wis.; bids close Jan. 10 at Escanaba, Mich.

200 tons, shapes and bars, postoffice, Yuma, Ariz.; bids Jan. 25.

127 tons, Panama; bids Jan. 9, schedule 2824. Also, 75 tons of plates; 60 tons of soft steel bars, mainly flats, stock lengths 16 to 20 feet; 200 sheets, No. 12 to 24 standard gage; and 592 corrugated galvanized steel roofing sheets, 32½ inches wide and 10 to 12 feet long, No. 18 gage.

125 tons, bridge, Delaware City, Del.; Trieste & Earle, Philadelphia, awarded general contract.

100 tons, postoffice, Ambridge, Pa.; bids Jan. 17.

Equipment Market Remains Inactive; Prospects Vague

Japanese interests continue to take figures on machinery and equipment, according to reports from the East. Bids are closing early this month on further purchases for the navy department. Other than from these two sources, inquiry is light, most industries holding plans for the year in abeyance.

Advices from Pittsburgh state that the steel mill equipment market has reverted to routine activity on repair parts. Rehabilitation pledges are being confined largely to maintenance expenditures.

The market in the Middle West continues dull. Chicago Great Western railroad is expected to close this month on several tools pending for a number of weeks. Illinois Central recently placed two track welders. Other railroad inquiry is scarce and the usual lists drawn up at this time of the year are absent. First quarter prospects in the machinery and equipment fields remain rather indefinite.

Moving to Martins Ferry

Wheeling Structural Steel Co., Wheeling, W. Va., is completing the movement of its shop and equipment from Wheeling to Martins Ferry, O., the former location which was leased from the Baltimore & Ohio railroad to be abandoned. The new site permits ready river transportation facilities. The company has been moving its shop buildings to the new location since last summer.

Concrete Bars

Illinois to Buy 3000 Tons for Road Work—Inquiry Issued For 5000 Tons for Golden Gate Bridge Approaches—Effort at Price Stabilization Spreads to More Districts

REINFORCING BAR PRICES, PAGE 127

New York—Lower adjusted prices on billet steel reinforcing bars to some points, by which mill lengths and cut bars are based 1.50c and 1.65c, respectively at Buffalo and Pittsburgh, do not apply to the New York metropolitan territory where prices are unchanged. A heavy tonnage of reinforcing steel, both bars and mesh, is pending. Mesh prices have been weak, but rail steel is firm at 1.35c, eastern mill.

Boston—Current sales are light, with buyers shopping for concessions. Highways, several metropolitan district water supply projects and bridges furnish the bulk of inquiry. Connecticut and Rhode Island have highway sections up for action. On billet steel bars, mill lengths, the new price of 1.50c, Buffalo and Pittsburgh, applies to this territory.

Philadelphia—The Anchor Post Fencing Co., Baltimore, is inquiring for 5000 tons of steel bars, including 4000 special oval shaped bars for roadway approaches to the Golden Gate bridge, San Francisco. Philadelphia opened bids Dec. 30 on 175 tons of bars for the Thirtieth street viaduct. Orders are negligible. A stronger tone at Pittsburgh is not yet reflected here, with cut lengths unchanged at 1.76c to 1.86c, delivered, for carlots.

Pittsburgh—Kalman Steel Corp., Bethlehem, Pa., has taken 350 tons of new billet steel for the Negley run sewer here. Prices are beginning to be observed under the new schedule of 1.50c, Pittsburgh, Buffalo and Cleveland, for mill lengths and $3 up for cut lengths. A local mill will supply 500 tons of bars to the Rosslyn Steel & Cement Co., Washington, fabricators of the reinforcing steel in the central heating plant, Washington. Rust Engineering Co., Pittsburgh, is general contractor.

Cleveland—Mill lengths of new billet steel bars continue quotable here at 1.40c to 1.50c, mill. Effort toward firming the market recently was noted, after competition resulted in some low prices. Inquiry for 500 tons for state highway work in New Jersey is current. General contracts have been placed for several Ohio state projects for which bars will be required shortly. For the Cleveland Electric Illuminating Co.'s trestle at Avon Lake, O., 150 tons have been awarded.

Chicago—Federal buildings in Minnesota and Kentucky will require about 550 tons of reinforcing bars. For Illinois road work, about 3000 tons will be ordered, low bidders on general contracts for a large portion of this work having been announced last week. New inquiry otherwise is light and only small lots have been included among recent orders. A firmer price situation is looked for shortly, following sharp concessions over recent months.

Awards Compared

	Tons
Awards, week ended Dec. 31	2,224
Awards, week ended Dec. 24	1,468
Awards, week ended Dec. 17	3,170
Awards, this week, 1931	3,100
Av. weekly awards, 1931	6,808
Av. weekly awards, 1932	3,920
Av. weekly awards, Nov.	2,236
Awards to date, 1931	358,092
Awards to date, 1932	207,768

Contracts Placed

500 tons, central heating plant, Washington, to Rosslyn Steel & Cement Co., Washington; through Rust Engineering Co., Pittsburgh.

485 tons, viaduct, Newark, N. J., to Faitoute Iron & Steel Co., Newark; through J. F. Chapman & Son, contractors.

350 tons, Negley run sewer, Pittsburgh, to Kalman Steel Corp., Bethlehem, Pa.; through General Contracting Corp., Pittsburgh.

250 tons, state bridge, project 787-B, Choctawhatchee river, Washington and Walton counties, Florida, to Truscon Steel Co., Youngstown, O.; G. D. Auchter Co., Jacksonville, Fla., general contractor.

225 tons, addition to army and navy hospital, Hot Springs, Ark., to Laclede Steel Co., St. Louis.

165 tons, for Panama, to Bethlehem Steel Export Corp., Bethlehem, Pa.

150 tons, trestle for Cleveland Electric Illuminating Co. at Avon Lake, O., to Paterson-Leitch Co., Cleveland,

through Hunkin-Conkey Construction Co., Cleveland.

100 tons, state road work, Owego, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh; through Frank Lewis Oneonta, N. Y., contractor.

Contracts Pending

5000 tons, for approaches to Golden Gate bridge, San Francisco; Anchor Post Fencing Co., Baltimore, inquiring. Includes 4000 special oval shaped bars.

400 tons, narcotic building, Lexington, Ky.

287 tons, ⅜ to ⅞-inch round structural billet steel bars, 30-foot lengths, Panama; bids Jan. 5. Republic Steel Corp., Youngstown, O., low on approximately 165 tons at $5351.04, delivered. Bids Dec. 21, schedule 2818.

150 tons, detention home, department of justice, Sandstone, Minn.

100 tons, state bridge, Okemah, Okla.; Boardman Co., Oklahoma City, contractor.

Nonferrous Metals Bow To Holiday Dullness

New York—The usual holiday letdown and year-end inventory taking accentuated dullness in the metals last week. Custom smelters still were willing to sell electrolytic copper at 5.00c, Connecticut, for delivery through first quarter and at 5.12½ for second quarter shipment. Some were reluctant to do business on these bases. Mine producers still were out of the market at the nominal price of 6.25c. Sellers look for some increase in business early in first quarter but no material price advance. Zinc and lead both held steady but were in light demand. Continued strength in ore supported zinc. Tin showed unusual steadiness, spot Straits generally averaging around 22.80c. Antimony held at 5.40c. Nickel and aluminum were quiet and unchanged. Quicksilver held at $49 a flask in small lots.

Mexico May Build 750 Mile Railroad to Yucatan

Ex-president Plutarco Calles, as counsellor for the National Railways of Mexico, has proposed to the ministry of communications and public works, Mexico City, that a 750-mile railroad be built to link the peninsula state of Yucatan with the rest of Mexico. The estimated cost is 65,012,288 pesos, or approximately $21,670,000. For rails, switches, grade crossings, etc., the cost is estimated at about $7,000,000; for locomotives and freight and passenger cars, slightly under $1,000,000.

Pipe

Southern and Eastern Foundries Resume—Prices Hold on 1200 Tons of Cast for Boston

PIPE PRICES, PAGE 144

New York—Several eastern cast pipe foundries have been down, but will open shortly with small backlogs. Prices on the small volume of business, largely in 70 to 80-ton lots for state hospital water lines are steady at $30 to $32, foundry. The largest pending tonnage is for state highway work, bids on additional construction of this type going in at Albany Jan. 6.

Boston—Prices on the first substantial tonnage for 1933, about 1200 tons for Boston, held well. Warren Foundry & Pipe Co., Wharton, N. J., bid $35.25 for 8-inch, $35.20 for 12-inch, and $35 on 16-inch. United States Pipe & Foundry Co., Burlington, N. J., taking this similar lot last year, bid $35.60 on all sizes. These are delivered prices. An order for 450 tons of class 150, centrifugal pipe for Bangor, Me., went to the Florence, N. J. foundry. A small tonnage of steel pipe was recently purchased by the Tenney interests for a gas installation in the Springfield district.

Birmingham, Ala—Cast iron pipe plants here resumed production Jan. 2, after the holiday suspension. The belief prevails that business will show substantial improvement this month.

Pittsburgh—Mercer Tube & Mfg. Co. expects to begin initial operations at its plant at Sharon, Pa., Jan. 5. This company recently took over the American Steel Foundries plant there. Jobbers are poor buyers of standard pipe, and there is little feature in the market for line pipe, oil country goods or conduit.

Cast Pipe Placed

1200 tons, 8 to 16-inch, Boston, to Warren Foundry & Pipe Co., Wharton, N. J.

450 tons, 20-inch, class 150 centrifugal, Bangor, Me., to R. D. Wood & Co., Florence, N. J.

100 tons, 6, 8 and 12-inch class 150, Bremerton, Wash., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

800 tons, Denville, N. J.; to take bids soon.

250 tons, Conroe, Tex.; bids in.

Steel Pipe Pending

100 tons, 2-inch and under, galvanized steel or wrought iron pipe, Panama; bids Jan. 9, schedule 2824.

Unstated tonnage, 19,999 cold-drawn seamless steel boiler tubes for navy; Michigan Seamless Tube Co., South Lyon, Mich., low at $8419.69 for 11,876 tubes, Boston, Brooklyn, N. Y., and Norfolk, Va.; $6882.83 for 8123 tubes, Mare Island, Calif., and Puget Sound, Wash., delivered; bids Dec. 20.

Financial News of Steel Industry

HARBISON-WALKER REFRACTORIES CO., Pittsburgh, has deferred action on its quarterly preferred dividend of $1.50 due at this time. At a special meeting Dec. 19, stockholders approved a plan to reduce the company's common stock by 60,000 shares to 1,380,000 no-par shares and a change in the stated value of the latter shares from $25 to $15 per share.

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Laclede Steel Co., St. Louis, has declared the regular quarterly dividend of 15 cents a share, payable Dec. 31, to record of Dec. 23.

Bar Iron Wages Reduced For January, February

Wages in bar mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be reduced in January and February, puddlers to receive $9.05 per ton, instead of $9.30 in the past two months. This results from the fact that the average sales price of bar iron in November and December was 1.45c per pound, compared with 1.50c in the preceding two months. Following are further price comparisons:

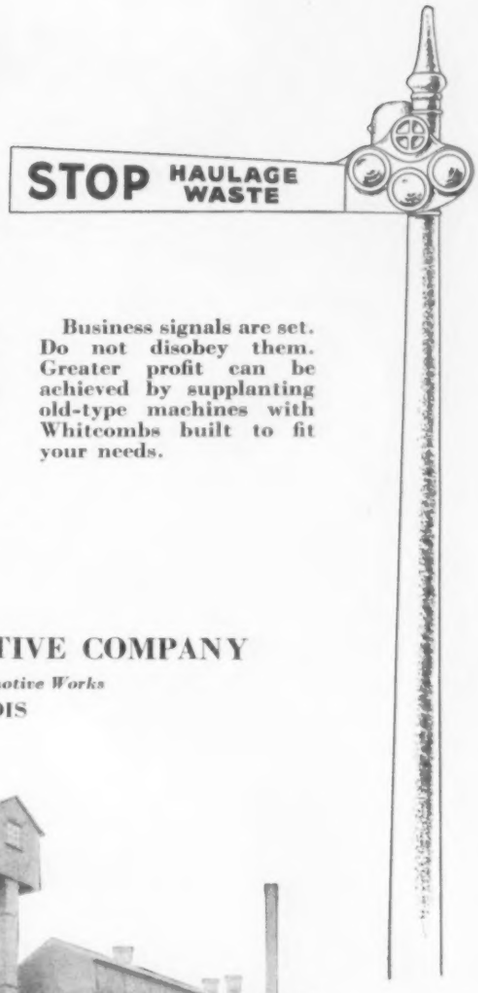
	1932	1931	1930
Jan.-Feb.	1.65c	1.70c	1.95c
March-April	1.65c	1.70c	1.90c
May-June	1.50c	1.70c	1.90c
July-Aug.	1.45c	1.70c	1.80c
Sept.-Oct.	1.50c	1.65c	1.80c
Nov.-Dec.	1.45c	1.65c	1.70c
Yearly average	1.53c	1.66c	1.84c

German Tool Industry Low

The German tool industry as a whole is operating at less than 33 per cent of what may be considered normal, according to a report to the department of commerce from Cologne.

WHITCOMB, a Real "Yardmaster" of Profit

We ask only two things of prospective buyers of haulage machines . . . One is to watch a Whitcomb at work . . . The other is to compare its operating costs with any other type of haulage machine, bar none . . . One trip around the yard will show you that a Whitcomb internal combustion locomotive will start heavier loads, haul heavier loads, and be cleaner and quieter about it than any other haulage machine . . . A few years' use will show you that its rugged durability, economy on personnel, lack of standby loss, and low maintenance costs, place it at the head of the list as a machine of economy, efficiency and faithfulness . . . Let Whitcomb show you the evidence . . . Remember, we sell more than equipment. We sell service . . . Write, phone or wire for interesting details . . . Whitcomb sales and service everywhere.



Business signals are set. Do not disobey them. Greater profit can be achieved by supplanting old-type machines with Whitcombs built to fit your needs.

THE WHITCOMB LOCOMOTIVE COMPANY

Subsidiary of the Baldwin Locomotive Works

ROCHELLE, ILLINOIS

FREE UPON REQUEST

A 16-page bulletin describing Whitcomb Industrial Locomotives. Also our magazine HAUL-AGE. Send for them.

WHITCOMB LOCOMOTIVES

AMERICAN STEEL SHEETS

FOR ALL KNOWN USES

AMERICAN
SHEET AND TIN PLATE COMPANY
PITTSBURGH
TRADE MARK REG. U.S. PAT. OFF.

In Industry and Construction

SHEET METALS of UTILITY and SERVICE, beginning in the metallurgical laboratory and ending with unqualified approval by the ultimate user—have made AMERICAN products a most reliable and satisfactory source of supply. This record for excellence is the user's best assurance also of continued highest standards in sheet steel manufacture in time to come.

KEYSTONE Copper Steel—the original copper steel alloy, is unexcelled for uses requiring the maximum of endurance and rust-resistance. Send for Weight Cards and copy of our interesting "Anti-Corrosive Metal" booklet.

Write for full information on AMERICAN Black and Galvanized Sheets, Formed Roofing and Siding Products, Sheets for Special Purposes, Tin and Terne Plates, Black Plate, etc. This Company also produces U S S STAINLESS and Heat Resisting Steel Sheets and Light Plates.

U S STEEL

American Sheet and Tin Plate Company

GENERAL OFFICES: Frick Building, PITTSBURGH, PA.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

KEYSTONE AMERICAN

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

AMERICAN BRIDGE COMPANY
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CARNEGIE STEEL COMPANY
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FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
OIL WELL SUPPLY COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R.R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, San Francisco, Calif.

Export Distributors—United States Steel Products Company, New York, N. Y.

Strip

Production Is at Better Rate Than in Summer but Bookings For First Quarter Are Small

STRIP PRICES, PAGE 127

Pittsburgh—A strip mill here operated its 12 and 16-inch mills for a few turns beginning Dec. 27 but otherwise mill operations, which were down last week, were in keeping with greatly curtailed strip demand. Practically no business is on strip mill books for January shipment. The hot-rolled market is 1.45c, Pittsburgh, and 2.00c is reported the cold-rolled base.

Worcester, Mass. — Cold-rolled strip is steady at 2.20c, Worcester, but in some industries is meeting with sharp competition with hot-rolled where sellers of the latter are attempting to substitute the lower-priced product. Business is largely on narrower widths and volume, while temporarily lighter, is expected to rebound to the recent rate this month. Stamping shops, as a rule, are buying in small lots, with little reserve stock on hand A Rhode Island mill has booked a small lot for the Rock Island, Ill., arsenal.

Philadelphia—Steel strip in this market continues quiet and prices are unchanged.

Cleveland—Strip orders from all sources during the week were much lighter, little of consequence developing from the automotive industry. Cold-rolled strip continues at 1.90c to 2.00c, base, Cleveland; and hot-rolled at 1.45c to 1.50c, base, Pittsburgh. A dearth of contracting for first quarter is noted.

Chicago—Strip mill operations are maintained around 10 per cent despite a small decline in miscellaneous orders. This rate is considerably better than that attained during midsummer, but the outlook for January is rather indefinite. Some moderate increase in orders from small consumers as well as a steady demand from automotive interests, however, is anticipated. Forward buying usually is limited to small lots at 1.55c, Chicago, for hot strip and 2.00c, Pittsburgh-Cleveland, for cold-rolled strip.

Operations Gain to 13 Per Cent; Go Higher This Week

Pittsburgh—Steel production here last week was at 10-11 per cent and the outlook for this week calls for a probable three-point gain to around 14 per cent. A leading mill here operated last week at 11 per cent, having closed several divisions entirely. The Farrell, Pa., steelworks reopened Dec. 27 with six open hearths on, the same day as the Duquesne works closed its four active open hearths. There are still 8 out of 53 steelworks blast furnaces on slow blast here.

Operations, week ended Dec. 31	**13**
Operations, week ended Dec. 24	**12**
Operations, week ended Dec. 17	**14**
Operations, one year ago	**15-20**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9 & Dec. 24	**12**

Philadelphia—Steelmaking operations in the week ended Dec. 31 averaged 8 to 9 per cent. This week a slight rebound is expected, with at least 15 to 16 per cent in prospect later in January.

Buffalo—Buffalo steelworks operated at 16 per cent during the greater portion of the week following the Christmas holiday, six open hearths in the district being in production during that period. About the same number will probably run part time during the first ten days of January, following the usual year-end holiday suspensions.

Cleveland—Steel ingot production here for the week ended Dec. 31, which included the shutdown Dec. 25 and 26, averaged 17 per cent. Immediately after the Christmas holidays the rate was increased to 26 per cent, the same as before. And on Dec. 30 an additional open hearth was lighted. The rate at the close of the week, therefore, was 29 per cent. No shutdowns were scheduled for the New Year holiday, and at the beginning of the current week the rate continued at 29 per cent. Corrigan, McKinney Steel Co. and Otis Steel Co. each have four open hearths active; American Steel & Wire Co. two.

Chicago—Except for the interruption occasioned by the Monday holiday, steelmaking operations during the past week held around the rate of the preceding week to ten days. The recent average of around 10 per cent is expected to improve moderately with the new month. Blast furnace schedules hold at eight active stacks out of 36.

Birmingham, Ala.—The steel rate in the week ended Dec. 31 was below 12 per cent, and for the current week will be 15 to 18 per cent.

Warehouse Sales Small Some Sheet Adjustments

Warehouse Prices, Page 144

New York—Warehouse volume dried up in the closing week of the year and for 1932. Most jobbers note an average reduction of 25 to 30 per cent in volume compared with 1931.

Warehouses here have adjusted prices on cold-finished materials, to 4.04c on flats and squares and 3.45c on rounds and hexagons. This is practically no advance as bessemer analysis extras are included. New extras of 2.50c on 100 pounds or under and 1.25c on 100 to 300 pounds are in effect.

Boston—Special galvanized sheets have been marked down to 5.30c by leading warehouse distributors in the New England territory. Prices on other items out of warehouse are officially unchanged, but untested in view of the dearth of business.

Philadelphia—Jobbers may shortly announce revisions in prices of certain special brands of sheets. Trading is dull.

Pittsburgh—Due to shrinkage in sales the last two weeks of December, warehouse sales in this district for the month were the lowest of any month in 1932. All prices are unchanged, including blue annealed sheets at 3.00c.

Cincinnati — Tonnage of warehouses here during December was considerably less than in November, with much of the loss shown in the past two weeks.

Chicago—Sales declined sharply the past week with some recovery expected after the inventory-taking period. Prices are unchanged.

St. Louis—Movement of steel commodities from warehouse has shown more than the expected seasonal decline.

Imports by Argentina Fall

Argentina in 1931 imported 438,592 metric tons of heavy iron and steel products valued at $25,216,822 in gold, a decline of 50 per cent in quantity from 1930, according to the department of commerce, Washington. Only in plates, bars, shapes and strip did 1931 imports exceed those of 1930.

VANCORAM BRAND FERRO-ALLOYS

FERRO-VANADIUM
Open Hearth, Electric and Crucible Grades

FERRO-CHROMIUM
High Carbon Grade (4 to 6% carbon). Low Carbon Grades (from maximum .06% carbon to maximum 2% carbon)

FERRO-SILICON
15%, 50%, 75%, 80-90%, 90-95% Grades

FERRO-TITANIUM

SILICO-MANGANESE

TUNGSTEN

MOLYBDENUM

ALSIFER
The Ferro-Silicon-Aluminum Deoxidizer Without a Disadvantage.

Also Special Alloys of Vanadium, Silicon, Chromium, Etc.

Large stocks are always maintained for prompt shipment. Write for complete information and prices.

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PITTSBURGH, *Bridgeville, Pa.*

DETROIT, *Book Tower*

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.

Research and Development Laboratories at Bridgeville, Pa.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2	
Chicago, furnace	$15.50
Pittsburgh, dist. furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.26 to 13.76
Virginia furnace	17.25
Granite City, Ill., furnace	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. Louis	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock delivery	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinci.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10
FOUNDRY, NO. 2X	
Buffalo, fur., local delivery	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Philadelphia	13.76 to 14.26
FOUNDRY, NO. 1X	
Buffalo fur., local delivery	17.50
Eastern, del. Philadelphia	14.26 to 14.76
MALLEABLE	
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo, fur., local del.	16.50
Eastern Penna, delivered	14.63 to 18.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60
BASIC	
Pittsburgh, district furnace	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., delivered	13.50
Buffalo fur., local delivery	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00
BESSEMER	
Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
LOW PHOS.	
Valley furnace, standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00
GRAY FORGE	
Valley furnace	14.00
Pittsburgh district furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
CHARCOAL	
Lake Superior, del. Chicago	23.04
SILVERY	

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS	
Connellsville furnace	$1.75 to 2.00
Connellsville foundry	2.50 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
BY-PRODUCT FOUNDRY	
Newark, N. J., delivered	8.21 to 8.81
Chicago, ovens, outside del	7.00
Chicago, delivered	7.75
New England, delivered	10.00
St. Louis, delivered	7.75
Birmingham, ovens	4.00
Indianapolis, delivered	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, delivered	8.50

Iron Ore

LAKE SUPERIOR ORE	
Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40
EASTERN LOCAL ORES	
Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces (Nominal)	
Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.
FOREIGN ORE	
Cents per units, alongside docks Atlantic ports (Nominal)	
Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50 to 9.00
North African low phos.	7.50 to 8.50
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot, short ton unit, duty paid	$ 9.75 to 10.00
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	nominal
South African, 52%	18 to 19 cents
*South African, 49-51%	nominal
*South African, 44-47%	nominal
Indian, 48-50%	20 cents
Brazilian, 46-48%	18 cents

Refractories

FIRE CLAY BRICK	
Per 1000 f.o.b. Works First Quality	
Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	30.00
Second Quality	
Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00
SILICA BRICK	
Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala	50.00
MAGNESITE BRICK	
Per Net Ton	
Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00
CHROME BRICK	
Per Net Ton	
F.o.b. shipping point	$42.50
MAGNESITE	
Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS	
4 x 4-inch base	
Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75
SHEET BARS	
Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00
SLABS	
Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
WIRE RODS	
Pittsburgh, Cleveland	$37.00
Chicago	38.00
SKELP	
All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82%, tidewater, duty paid	$68.00
Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
Ferrosilicon, 50 per cent, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120.00 to 130.00
Silicomang., 2½% carb.	85.00
2% carbon	90.00
1% carbon	100.00
(The above for spot carlots. Contract price $5 a ton less.)	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, for spot delivery	10.00
Ferrotungsten, stand., lb. cont.	0.94 to 1.00
Ferrovanadium, 35 to 40 per cent, per lb. contained, on analysis	2.60 to 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent, per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

†Carloads. Differentials apply to quant.

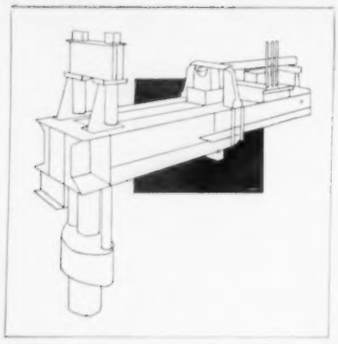
Fluorspar

85 and 5 per cent grade

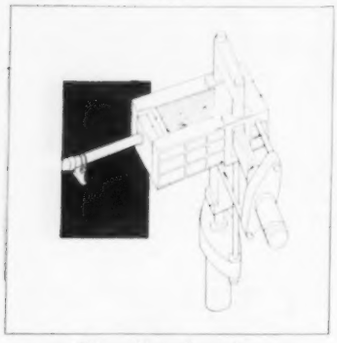
*Washed gravel, f.o.b. Ill., Ky., net ton car loads	$10.50
Washed gravel, import duty paid tide, gross ton	18.50

LOGEMANN

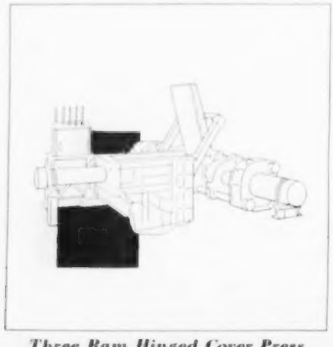
A Full Line



Ejection Type Standard Press



Three Ram Press for bulky scrap



Three Ram Hinged Cover Press for Drums, Etc.

Whether your scrap accumulation warrants a hand press—a car baler—or equipment in between—there is a Logemann press for the job. Fast working—efficient—Logemann balers answer every scrap metal need. They meet any installation requirement. And—they fill the bill of low cost operating demands.

To bale scrap metal is an obvious saving. To bale it with a Logemann press makes this fact doubly certain. Fool proof mechanical features and long life construction offer an indisputable evidence of achievement. It is written indelibly in the profit records of industrial users. A Logemann press is an investment that pays.

Logemann engineers will be glad to prove this fact in your plant. Ask them.

LOGEMANN BROS. CO.

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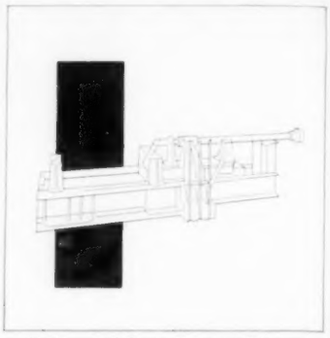
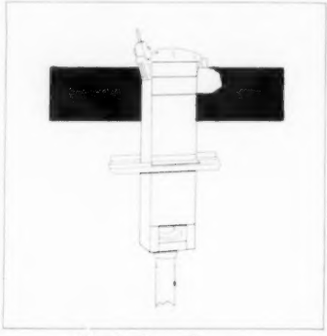
Branch Offices in Principal Cities

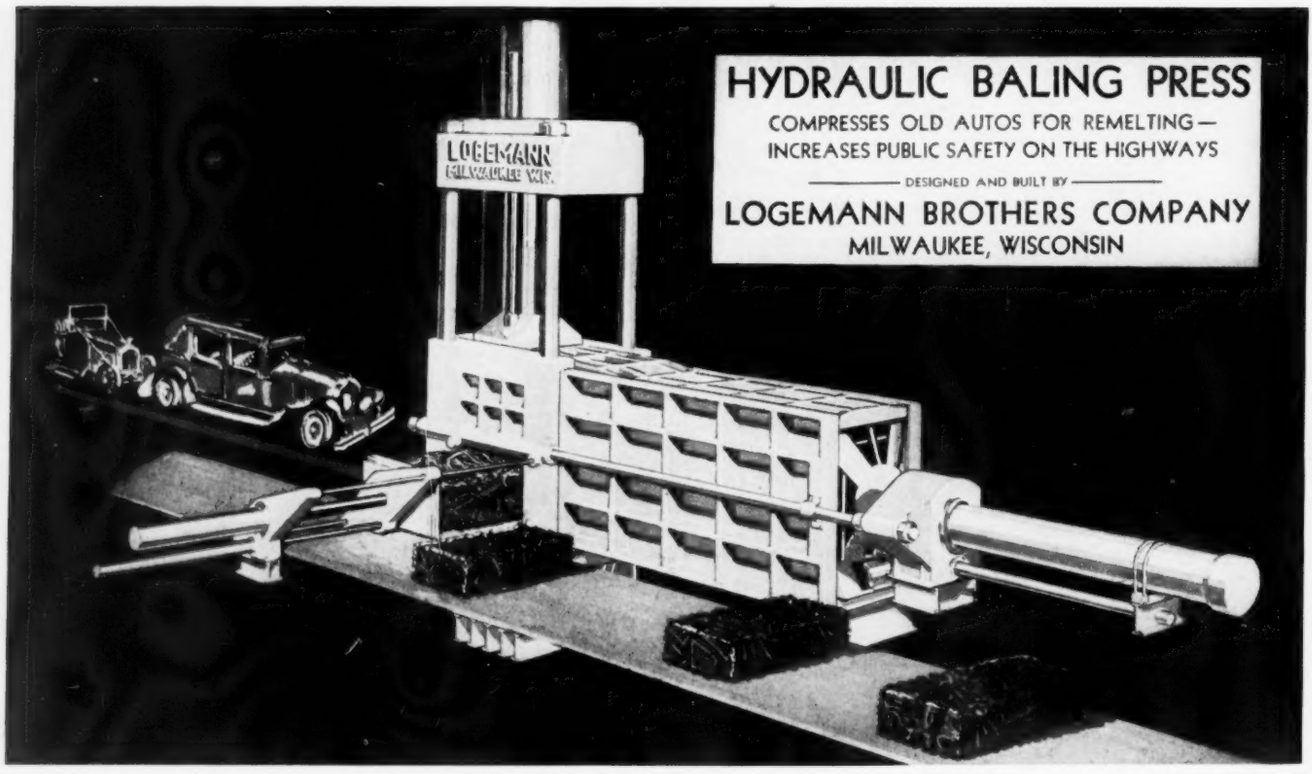


Horizontal Type Standard Press



Single Ram Press-- usually for cans

Mechanical Type Press



Scrap

Trade in Doldrums as Year Is At Turn—Necessities Point to Enlarged Buying Soon

Every consuming center for steel and iron scrap is in the same position, melters remaining out of the market except for occasional small lots to meet immediate needs. To such an extent has this avoidance of buying been carried that some steelmakers have been forced to ask unusual delivery concessions from dealers to bring them supplies urgently required. This shortness of supplies and expected increased open-hearth melt in January are the basis for belief that month will bring increased buying and a more active market. Prices are practically stationary and largely nominal, the level being so low it is believed any increase in buying would bring an immediate advance. Pennsylvania and Baltimore & Ohio railroads offer tonnages.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to	8.00
Boston, dealers	2.75 to	3.25
Buffalo, No. 1	7.00 to	7.50
Buffalo, No. 2	6.00 to	6.50
Chicago	5.00 to	5.50
Cleve., No. 1	7.00 to	7.50
Cleve., No. 2	6.00 to	6.50
Det., No. 1 deal.	4.50 to	5.00
Det., No. 2 deal.	3.00 to	3.50
E. Pa. del. mill		6.50
E. Pa., No. 2 del.	5.00 to	5.50
N. Y. deal. R. R.	4.00 to	4.50
N. Y. deal. No. 2		3.00
N. Y. deal. yd.	2.50 to	3.00
Pitts. No. 1	8.25 to	8.75
St. L. No. 1 sel.	5.50 to	6.00
Federal, Ill.	4.75 to	5.25
Granite City, Ill.	5.00 to	5.50
Valleys, No. 1	8.50 to	9.00

COMPRESSED SHEETS

Buffalo, dealers	6.00 to	6.50
Chi. (Factory)	3.75 to	4.25
Cleveland	6.50 to	7.00
Detroit, dealers	4.00 to	4.50
E. Pa. new mat.	5.00 to	5.50
Pittsburgh	8.00 to	8.50
Valleys	8.25 to	8.75

BUNDLED SHEETS

Buffalo	4.00 to	4.50
Cincinnati, del.	4.25 to	4.75
Cleveland	4.50 to	5.00
Eastern, Pa.		5.00
Pittsburgh	7.00 to	7.50
St. Louis	1.50 to	2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to	2.50
Cincinnati	2.00 to	2.50
Detroit, dealers	1.25 to	1.75
St. Louis	1.50 to	2.00

STEEL RAILS SHORT

Birmingham	8.50 to	9.00
Boston, dealers	2.75 to	3.00
Buffalo	9.50 to	10.00
Chicago (3 ft.)	7.50 to	8.00
Chicago (2 ft.)	8.00 to	8.50
Cincinnati, del.	9.00 to	9.50
Detroit, deal.	8.00 to	8.50
Pitts. (open-hearth, 3 ft. and less)	10.00 to	11.00
St. Louis	7.00 to	7.50

STOVE PLATE

Birmingham	5.00 to	5.50
Boston, realers	2.00 to	2.50
Buffalo	7.50 to	8.00
Chicago, net	4.50 to	5.00
Cinci., deal. net	3.50 to	4.00
Det., net deal.	2.50 to	3.00
Eastern, Pa.	6.00 to	6.50
N. Y., deal. mill	2.50 to	3.00
St. Louis	5.50 to	6.00

COUPLERS, SPRINGS

Buffalo	9.00 to	9.50
Chicago	6.50 to	7.00
Eastern Pa.		8.50
Pittsburgh	8.75 to	9.25
St. Louis	5.25 to	6.25

ANGLE BARS—STEEL

Chicago	7.00 to	7.50
St. Louis	5.75 to	6.25

LOW PHOSPHOROUS

Buffalo, billets and bloom crops	9.00 to	9.50
Cleveland bil. and bloom crops	10.00 to	11.00
Eastern Pa.		8.50
Pittsburgh billet bloom crops	10.00 to	11.00
Pitts., sheet bar crops	10.50 to	110.0

FROGS, SWITCHES

Chicago	5.50 to	6.00
St. Louis	5.00 to	5.50

SHOVELING STEEL

Chicago	5.00 to	5.50
Cleveland	5.75 to	6.00
St. Louis	4.75 to	5.25

RAILROAD WROUGHT

Birmingham	7.50 to	8.00
Boston, dealers	1.00 to	1.50
Buffalo, No. 1	4.50 to	5.00
Buffalo, No. 2	7.00 to	7.50
Cinci., No. 2	5.00 to	5.50
Chi., No. 1, net	4.50 to	5.00
Chicago, No. 2	5.50 to	6.00
Eastern Pa.		6.50
N. Y., No. 1, deal.	2.50 to	3.00
Pitts., No. 2	8.25 to	8.75
St. Louis, No. 1	3.50 to	4.00

SPECIFICATION PIPE

Boston	3.00 to	4.00
St. Louis	4.75 to	5.25
Eastern Pa.	7.00 to	7.50
N. Y., deal	2.00 to	2.25

BUSHELING

Buffalo, No. 1	6.00 to	6.50
Chicago, No. 1	3.75 to	4.25
Cinci., No. 1 dl.	4.00 to	4.50
Cinci., No. 2	2.50 to	3.00
Cleve., No. 2	3.00 to	3.50
Det., No. 1 new deal.	3.25 to	3.75
St. L., No. 1	3.00 to	3.50
Val. new No. 1		8.75

MACHINE TURNINGS

Birmingham	2.50 to	3.00
Boston, dealers	0.75 to	1.00
Buffalo	3.75 to	4.25
Chicago	3.00 to	3.50
Cinci., deal	3.00 to	3.50
Cleveland	4.50 to	5.00
Detroit	1.25 to	1.75
Eastern Pa.	3.00 to	3.50
N. Y., deal.	1.35 to	1.50
Pittsburgh	6.25 to	6.75
St. Louis	1.50 to	2.00
Valleys	6.50 to	7.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	0.75 to	0.90
Buffalo	3.75 to	4.00
Cinci., deal	3.00 to	3.50
Cleveland	4.50 to	5.00
Detroit, deal.	1.75 to	2.25
Eastern Pa.	3.50 to	3.75
N. Y., deal.	1.35 to	1.50
Pittsburgh	5.50 to	6.00

CAST IRON BORINGS

Birming., chem.	12.00 to	13.00
Birming., plain	2.50 to	3.00
Boston, chem.	5.50 to	6.00
Boston, dealers	1.00 to	1.25
Buffalo	4.25 to	4.50
Chicago	3.00 to	3.50
Cinci., deal.	3.00 to	3.50
Cleveland	4.50 to	5.00
Detroit, deal.	1.75 to	2.25
Eastern Pa.	3.50 to	3.75
E. Pa., chem.	8.00 to	10.50
N. Y., deal.	1.00 to	1.50
Pittsburgh	5.50 to	6.00
St. Louis	2.00 to	2.50

PIPE AND FLUES

Cinci., deal.	3.25 to	3.50

RAILROAD GRATE BARS

Buffalo	4.00 to	4.50
Chicago, net	5.00 to	5.50
Cincinnati	4.00 to	4.50
Eastern Pa.	5.50 to	6.00
N. Y., deal.	3.50 to	4.00
St. Louis	4.50 to	5.00

FORGE FLASHINGS

Boston, dealers	2.00 to	2.50
Buffalo	5.50 to	6.00
Cleve. ov. 10 in.	6.00 to	6.50
Detroit	2.75 to	3.25

FORGE SCRAP

Boston, dealers	1.75 to	2.00
Chicago	6.50 to	7.00
Eastern Pa., del.	5.00 to	5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to	5.50
St. Louis	3.50 to	4.00

AXLE TURNINGS

Boston, deal.	2.50 to	3.00
Buffalo	6.25 to	6.75
Chi., elec. fce.	4.50 to	5.00
Cleveland	5.50 to	6.00
Eastern Pa., del.		7.00
Pittsburgh, O. H.	7.00 to	7.50
St. Louis	3.00 to	3.50

STEEL CAR AXLES

Birmingham	9.00 to	9.50
Boston, ship pt.	6.00 to	6.50
Buffalo	10.00 to	10.50
Chicago, net	8.50 to	9.00
Eastern Pa.		14.50
St. Louis	8.75 to	9.25

SHAFTING

Boston, ship pt.	6.50 to	7.00
N. Y., deal.	6.50 to	7.00
St. Louis	7.50 to	8.00
E. Penna.	11.00 to	12.00

CAR WHEELS

Birming., iron	7.00 to	7.50
Boston, iron deal.	3.25 to	3.50
Buffalo, iron	7.00 to	8.00
Buffalo, steel	8.50 to	9.00
Chicago, iron	7.00 to	7.50
Chi., rolled steel	7.00 to	7.50
Cincinnati iron	6.25 to	6.75
E. Pa. steel	8.50 to	9.00
E. Pa. iron		8.50
Pitts, iron	7.75 to	8.25
Pitts., steel	8.75 to	9.25
St. Louis, iron	4.75 to	5.25
St. Louis, steel	6.00 to	6.50

NO. 1 CAST SCRAP

Birmingham	8.00 to	8.50
Buffalo (Mach.)	9.75 to	10.25
Buffalo, cupola	9.00 to	9.50
Boston, textile	6.75 to	7.00
Boston No. 2	2.25 to	2.50
Chi., mach. net	5.50 to	6.00
Chi., railroad net	5.00 to	5.50
Chicago, agri., net	5.00 to	5.50
Cinci., mach. cup	7.00 to	7.50
Cleve. cupola	7.00 to	8.00
Det., net deal.	6.50 to	7.00
E. Pa. cupola	9.00 to	9.50
N. Y., cup. deal.	5.00 to	5.50
N. Y., del. local foundries	8.00 to	8.50
Pitts., cupola	8.50 to	9.00
San Fran., del.	13.50 to	14.00
Seattle	4.50 to	6.50
St. L. No. 1 ma.	6.00 to	6.50
St. L. No. 1	5.50 to	6.00

HEAVY CAST

Boston, del.	3.25 to	3.50
Bost., mach. cast	7.00 to	7.50
Buffalo, break.	6.50 to	7.00
Cleve., break	5.50 to	6.00
Detroit, auto net deal.	7.00 to	7.50
Det. break., dl.	4.00 to	4.50
Eastern Pa.	8.00 to	8.50
N. Y. No. 1, dl.	5.00 to	5.50
N. Y. break, dl.	4.50 to	5.00
Pittsburgh	8.00 to	8.50

MALLEABLE

Boston, consum.	7.50 to	8.00
Buffalo	8.00 to	8.50
Chicago, agri.	5.00 to	5.50
Chicago, R. R.	5.50 to	6.00
Cinci., R. R., del.	6.50 to	7.00
Cinci., agri. del.	6.00 to	6.50
Cleveland, rail	7.50 to	8.00
Det. auto deal.	5.00 to	5.50
St. Louis	7.00 to	7.50

RAILS FOR ROLLING

5 feet and over

Birmingham	8.00 to	9.00
Boston, deal.	5.00 to	5.50
Buffalo	7.00 to	7.50
Chicago	8.00 to	8.50
Eastern Pa.		9.50
New York dealer	4.25 to	4.75
St. Louis	7.00 to	7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to	7.50
St. L., No. 1	5.00 to	5.50

LOW PHOS. PUNCHINGS

Chicago	7.50 to	8.00
Buffalo	9.00 to	9.50
Eastern Pa.		8.50
Pittsburgh	10.50 to	11.00

Pig Iron

Substantial Basic Purchases at Pittsburgh—4000 Tons of British Iron Arrives at Philadelphia

PIG IRON PRICES, PAGE 137

Pittsburgh—Between 4000 and 5000 tons of basic pig iron has been placed by Edgewater Steel Co. here for shipment in January. It is reported a like tonnage will be awarded to the furnace interest for February shipment. Delivery will be made by the all-rail route. Price is undisclosed. The merchant iron trade is slow and prices continue nominal. Shenango Furnace Co. probably will resume blast at Sharpsville, Pa., some time this month.

Boston—Pig iron buying in New England continues in light volume, with prices unsettled. The local foundry holds to $16, furnace, minimum, and averaged about $17.50 on the bulk of its business during 1932. Domestic sellers are unable to meet prices on imported iron there being a good volume of the latter in storage. About 150 tons of Indian iron arrived last week.

New York—Demand for pig iron is expected to improve early in January. Prices are unchanged.

Panama is closing Jan. 9 on 100 gross tons of low phosphorus pig iron.

Philadelphia—Approximately 4000 tons of English iron arrived here recently on an old contract for a Delaware river pipemaker. This follows closely 6000 tons of Dutch iron also mainly for a Delaware river pipemaker. A number of foundries are expected to resume operations immediately, and to purchase iron.

Bids close Jan. 10 on 80 gross tons of grade A foundry pig iron for the navy, 45 tons being for Washington and 35 tons for Philadelphia.

Cleveland—Pig iron producers here are confident January shipments will gain over December's, which held near the November level. Much of this expectancy is based on a continuation of automotive requirements, and on improvement in miscellaneous lines that were practically flat during the past month. Actual releases, however, are limited; consumers do not know how much iron they will need, and are not buying or releasing until they obtain orders for castings. The carryover on specific contracts is the smallest in years, due to close buying. Consumers have no stocks, but furnace stocks are substantial, though associated steel interests here are rapidly using their furnaces' basic stocks. Sales during the week held at approximately 1000 tons: a few carloads were placed in the Cleveland market, with prices steady at $15, base, furnace for local delivery.

Cincinnati—The market was extremely dull during the week, while consumers awaited the close of the holiday period to gage the outlook. Sales were in carload lots for a total of a few hundred tons. No inquiries are current.

Chicago—Pig iron shipments hold around the rate of recent weeks, with the total December movement smaller than that of November, but moderately better than the lowest rate attained last summer. Heavier releases have been received for January shipments and with some betterment in prospect in orders from small consumers, increased activity during January is likely. Foundry operations have been restricted to a certain extent by the holiday interruption. Prices are steady at $15.50, furnace, for No. 2 foundry and malleable.

St. Louis—Considerable business in castings for brewery machinery has been placed with jobbing foundries here, and more is expected. One machinery company reports two firm orders from New York brewers for $60,000 worth of equipment, and conditional orders from others for heavy machinery worth $250,000.

Birmingham Ala.—Activity in the pig iron market practically ceased during the last week of the year. Melters now are expected to place some orders and specify as delivery is wanted.

Toronto, Ont.—Business in pig iron is practically at a standstill owing to the holiday season. It is understood several melters will be in the market immediately after Jan. 1. Prices are unchanged.

Semifinished Steel Quiet; Contracts Are Renewed

Semifinished Prices, Page 137

Producers of sheet bars, billets and slabs have renewed their arrangements with customers for first quarter, contracts to be specified against as material is required. The price is $26, base, Pittsburgh, Youngstown, O., and Cleveland. Tin plate mills still take the largest tonnage of sheet bars. Wire rods at $37 are in slower demand than forging billets at $31, Pittsburgh. Several small slab and billet orders were rolled on a grouping by a Pittsburgh district mill during the week.

Contracting for By-Products

New York—Coke oven by-product prices are unchanged. Activity is largely confined to covering on contracts for part of next season's requirements, there being little spot business. Contracting in distillates and naphthalene has stepped up. Phenol buying generally is in small lots. The January price for sulphate of ammonia is unchanged at $22 a ton, port.

Coke

Improvement in Orders Expected This Month—Beehive Market Prices Are Easy

COKE PRICES, PAGE 137

Pittsburgh—Metallurgical coke is moving at a slow rate. Prices range from $2.25 to $2.50 for standard beehive foundry coke, with premium $4 to $4.25. Demand for domestic heating coke is the best of any grade. Furnace coke is quoted $1.75.

Cincinnati — Specifications for by-product foundry coke were at a low mark during the past week, reflecting the light melt over the holidays. Domestic shipments tapered. Prices are unchanged.

Chicago—Although shipments of foundry coke have been fairly steady recently, milder weather has restricted consumption of fuel for heating purposes. Some increased demand for foundry coke is in prospect for January although the gain in the total movement is expected to be slight. Prices of by-product foundry coke are continued into the new quarter at $7, ovens, for outside delivery, and $7.75, delivered Chicago.

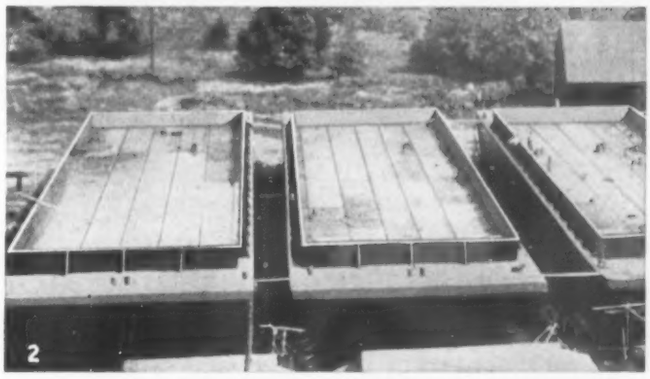
Birmingham, Ala.—Coke production is fairly steady, and little is being stocked. New business indicates melters will buy only small lots as required.

HOW LONG WILL IT LAST?

IN a cloud of spray and mist the new barge plunges from the ways to fulfill its destiny as a cargo carrier. How long will it last? The answer is simple—as long as its plates.

Therefore, be sure of the quality of your plates — and to do this, be sure of your source of supply.

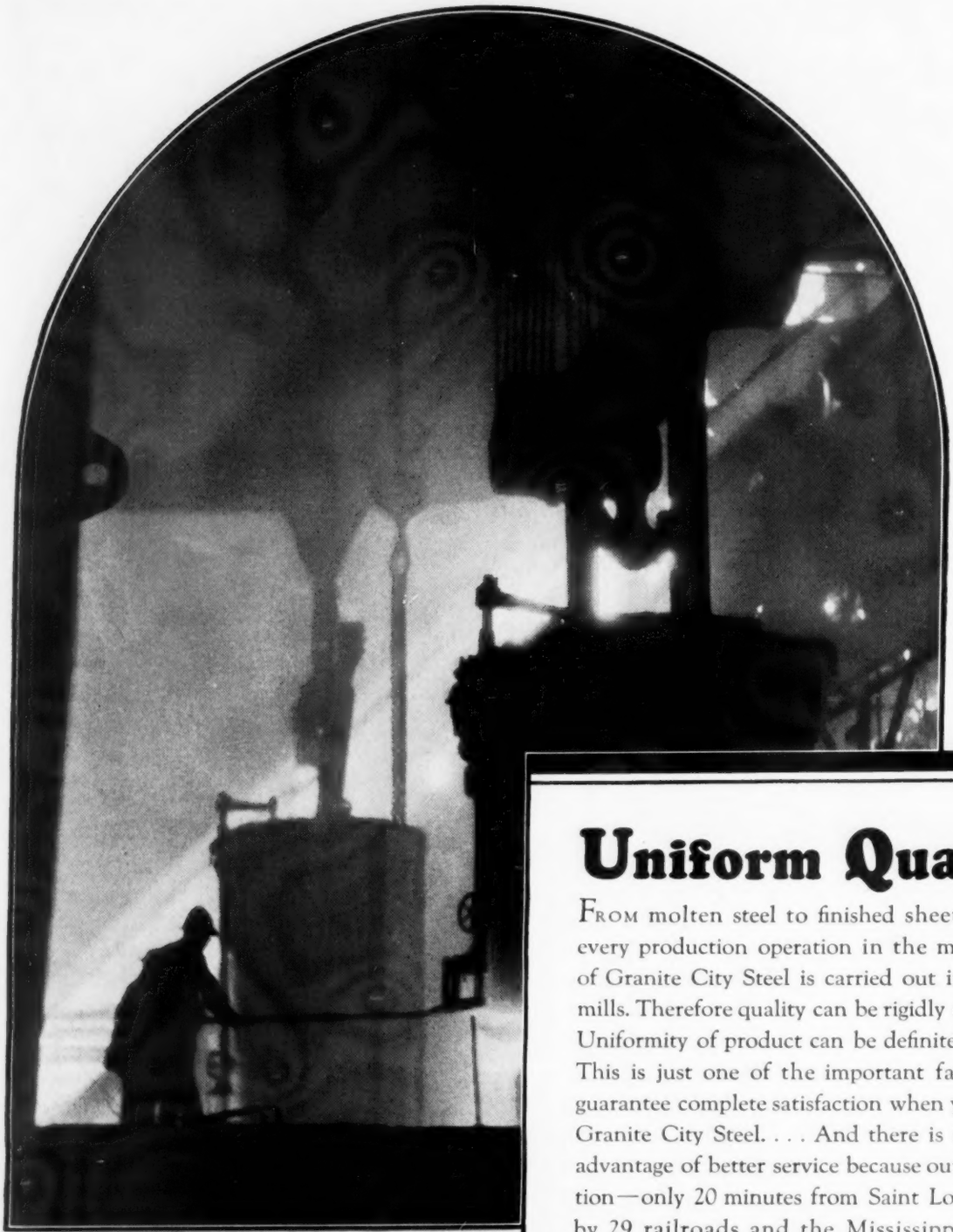
The barge building industry is one of many which, through years of satisfactory experience, has developed a well-placed confidence in Tennessee Plates and in other Tennessee rolled products.



1. *Launching of an all-steel barge.*
2. *All-steel barges under construction. (These barges made of Tennessee steel.)*

Tennessee Coal, Iron & Railroad Co.
General Offices: Brown-Marx Bldg., Birmingham, Ala.
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

TENNESSEE PLATES



Uniform Quality

FROM molten steel to finished sheet or plate, every production operation in the manufacture of Granite City Steel is carried out in our own mills. Therefore quality can be rigidly controlled. Uniformity of product can be definitely assured. This is just one of the important factors that guarantee complete satisfaction when you choose Granite City Steel. . . . And there is always the advantage of better service because our mill location—only 20 minutes from Saint Louis, served by 29 railroads and the Mississippi River—expedites delivery to the Mississippi Valley, the West and the Southwest.

Chicago, Dallas
Kansas City
Los Angeles

SINCE
REG. U.S. PAT. OFF.
GRANITE CITY STEEL
1878

St. Louis, St. Paul
San Francisco
Salt Lake City

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

•

GRANITE CITY STEEL CO
GRANITE CITY, ILLINOIS

Pacific Coast

Buying Shows Better Volume as Some Railroad Activity Comes Out—Considerable Tonnage Is On Active Inquiry—Northern Pacific Places Nearly 1000 Tons Of Tie Plates

San Francisco—(*By Air Mail*)—Although awards were limited to one or two lettings in excess of 100 tons, a number of new projects have come into the market for figures. These include 3881 tons for 180 miles of 5 to 8-inch gas line pipe for the metropolitan water district of Southern California, bids Dec. 27.

West Slope Construction Co., Chicago, is low bidder on San Gabriel dam No. 2 for Los Angeles county, Calif., involving 3838 tons. No award has been made on 3600 tons for the Golden Gate bridge.

Bids open on Jan. 4 for four boilers for the Mare Island navy yard. No action has been taken yet on 450 tons for a penstock and pipe line at Wapato, Wash. Prices are general at 2.00c, c.i.f.

Golden Gate Iron Works took 250 tons of structural shapes for an apartment in San Francisco and the Minneapolis-Moline Power Implement Co. booked 150 tons for bridges in Toole county, Utah and 205 tons additional for a post office at Merced, Calif.

Northwest Buying Grows

Seattle—Pacific Northwest awards this week in lots of 100 tons or more exceeded 1000 tons while small lots to the total of 150 tons were booked. Larger tonnages are pending. One hopeful indication is resumption of buying on a limited scale by some railroads. Outside of public works this is the only indication of buying by private interests. Railroads have also placed orders for next year's tie supplies, which will aid the lumber industry.

The largest tonnage pending in this territory consists of 1800 tons of plates for 8 miles of extension of Seattle's water system, involving 20, 24 and 30-inch pipe. The award has been made to Thomas Scalzo, Seattle, at $217,031 for welded steel pipe. However, there may be a delay due to litigation, while wood stave advocates still are fighting for their material.

Pacific Coast Steel Corp., Seattle, has an order to furnish 150,000 tie plates, 930 tons, for the Northern Pacific railroad, January delivery. Isaacson Iron Works, Seattle, will furnish 55 tons shapes for a Seattle underpass crossing, Truscon Steel Co. has the contract to supply 52 tons liner plate for a tunnel at Puget Sound Navy Yard. Rumsey & Co. general contractors, have bought 60 tons of second-hand sheet steel piling for the same job. Valley Iron Works, Yakima, booked a portion of the Wapatao, Wash., penstock and discharge pipe project, requiring 50 tons of plates. Originally 450 tons of plates were involved, but part of the work went concrete and wood stave.

Contract to furnish 100 tons of 6, 8 and 12-inch pipe for Bremerton, Wash., has been awarded to United States Pipe & Foundry Co., Burlingtons, N. J. Bids will be opened Jan. 24 at Ft. Lewis, Wash., for furnishing 264 tons of 4, 6 and 10-inch cast iron pipe. McNeil Island, Wash., penitentiary has $32,000 available for a new water system. United States Indian department, at Washington, will open Bids Jan. 3 on 77 tons cast iron pipe, steel tower and tank, pumps, etc., for the Indian village at Tahola, Wash. Awards of 60 tons of cast iron pipe at Kirkland, Wash., and 80 tons at Snohomish, Wash., are pending.

Steel in Europe

Holiday Season Dull, with Hope for Betterment

London—(*By Cable*)—Seasonal holiday quiet prevails, but an expansion in demand is confidently expected early in the new year. Domestic foundry pig iron demand is expanding but heavy steel remains dull. Prices of Continental steel now are below British, but transactions are on a low scale. Galvanized sheets are dull but prices of tin plate are hardening as orders increase.

The Continent reports that export trade is quiet and prices are sagging back to summer level. France reports the home and export trade both unsatisfactory.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 29

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$ 9.74	2 18 6	$ 8.27	1 14 0
Basic bessemer	8.99	2 14 0*	6.81	1 8 0
Hematite, Phos. .03-.05	9.82	2 19 0	....	.....
SEMIFINISHED STEEL				
Billets	$16.23	4 17 6	$9.61	1 19 6
Wire rods, No. 5 gage	24.98	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$25.81	7 15 0	$26.77	5 10 0
Merchant bars	.93c	6 5 0	.55c to .56c	2 10 0 to 2 11 0
Structural shapes	1.10c	7 7 6	.47c	2 2 6
Plates, †¼ in. or 5 mm.	1.30c	8 15 0	.63c to .64c	2 17 6 to 2 18 6
Sheets, black, 24 gage or 0.5 mm.	1.23c	8 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	1.49c	10 0 0	1.65c	7 10 0
Bands and strips	1.15c	7 15 0	.77c to .80c	3 10 0 to 3 12 6
Plain wire, base	1.41c	9 10 0	1.18c	5 7 6
Galvanized wire, base	1.71c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.64c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.66	0 16 0	$3.20	0 13 2

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$9.74	2 18 6	$ 8.00	205(2)	$ 8.31	300	$15.01	63
Basic bessemer pig iron	8.99	2 14 0*	6.63	170(1)	7.48	270	16.55	69.50
Furnace coke	2.00	0 12 0	4.84	124	3.05	110	4.57	19.20
Billets	16.65	5 0 0	14.43	370	10.66	385	22.99	96.50
Standard rails	1.23c	8 5 0	1.25c	697	1.50c	1,150	1.37c	127
Merchant bars	1.01c	6 15 0	.95c	530	.69c	530	1.19c	110
Structural shapes	1.30c	8 15 0	.99c	550	.65c	500	1.16c	107.50
Plates, †¼-in. or 5 mm.	1.34c	9 0 0	1.17c	650	.78c	600	1.37c	127
Sheets, black	1.38c	9 5 0‡	1.44c	800‡	.91c	700‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	1.68c	11 5 0	2.83c	1,570	1.87c	1,440	4.00c	370
Plain wire	1.41c	9 10 0	2.03c	1,130	1.69c	1,300	1.92c	178
Bands and strips	1.41c	9 10 0	.99c	550	.85c	650	1.37c	127

*Basic. †British ship-plates, Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe □

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
¼ & ⅜	57	34	½	28	10½
½	62	49½	¾	33	16½
¾	65½	55	1—1¼	36	20½
1—3	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD
Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7	+41
¼ & ⅜	53½	38½	½	28	12½
½	59	49½	¾	33	17½
¾	63½	54	1—2	39	23

LAP WELD
Extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½—4	39	25
5 & 6	62	52½	4½—6	38	24
8	58	47	7 & 8	36	22
10	51½	40½	9—12	26	13½
12	50½	39½			

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts are net.

BOILER TUBES
Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, in next column. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing □ □

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe □ □

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ..... $32.00 to 33.00
Four-inch, Birmingham .... 35.00 to 36.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y..... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $90.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $3 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3 25c

IRON BARS

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3 25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.20c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.45c
Chattanooga	3.50c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
New York	3.00c
Portland	4.00c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.45c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.05c
Chattanooga	3.95c
Chicago	3.50c-3.75c

††Base 15,000 lbs., extras on less.

Cincinnati	3.90c
Cleveland	3.75c
Detroit	3.75c
Houston	3.57c
Los Ang.	4.50c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	5.00c
San Fran.	4.55c
Seattle	5.00c
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL
Rounds and Hexagons

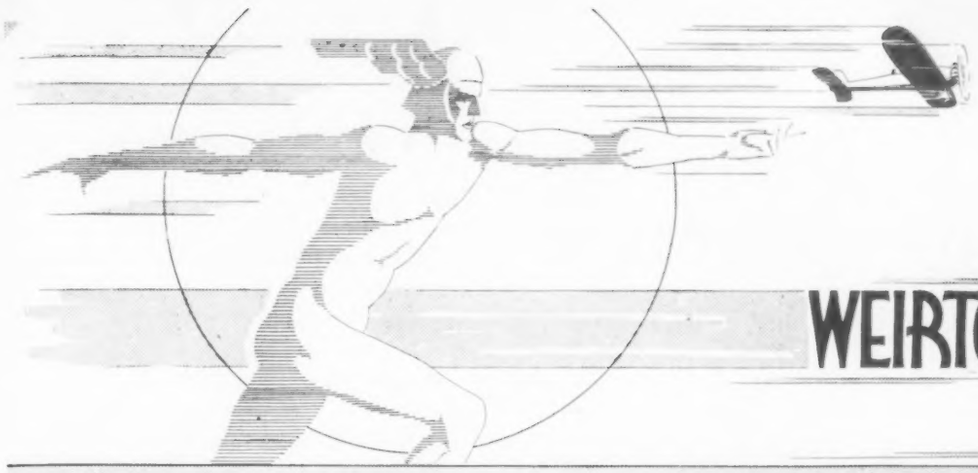
Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York(g)	3.54c
Philadelphia*	3.35c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran(d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

COLD ROLL. STRIP

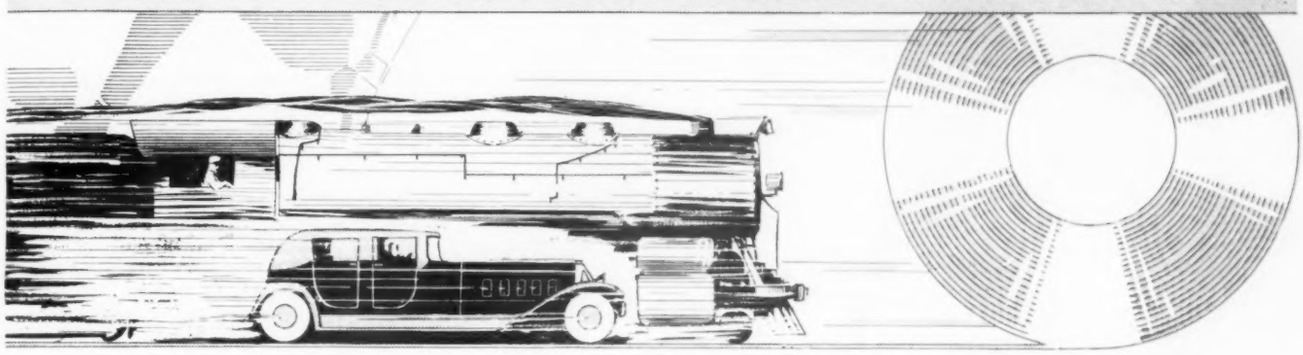
Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles.



WEIRTON

STRIP STEEL AND STRIP STEEL SHEETS UNROLL THE WAY FOR PROGRESS



Weirton Products Include:

Pig Iron
Open Hearth Steel
Billets—Slabs—Sheet Bars—Skelp
Angles, Beams and Channels
Round, Square and Flat Bars
Rails—Steel Plates—Tie Plates—
Splice Bars
Reinforcing Bars
Coke Tin Plate
Kanners Special Cokes—
Best Cokes—Charcoals
Lacquered and Coated Tin Plate
Tin Mill Black Plate (All Finishes)
Lacquered and Coated Black Plate
Open Hearth Copper Bearing Terne
Plate 8 lb. to 40 lb. Coated
Hot and Cold Rolled Strip Steel
and
Strip Steel Sheets
High Finish Sheets
Long Terne Sheets
(Common and Special Finishes)
Galvanized, Black and Blue
Annealed Sheets
Corrugated Sheets, V Crimp
Sheets, Roll Roofing
Single Pickled, Full Finished
and Auto Body Sheets
Coke—Tar—Benzol—Toluol—
Ammonium Sulphate
Many gauges and grades up to seventy-five inches in width are now available.

....WEIRTON Strip Steel and Strip Steel Sheets contribute to industrial progress because they are furnished in the *right* quality for every industrial use.

This *dependability* is the result of complete production control of our own organization—both mechanically and metallurgically—from ore mine to finished product.

The next time you are in need of Strip Steel and Strip Steel Sheets write in Weirton on your specification sheets and make satisfaction doubly sure.

WEIRTON STEEL CO.

Division of National Steel Corporation

WEIRTON W. VA.

SALES OFFICES IN ALL PRINCIPAL CITIES

"What's the difference" ... *But*

THERE *WAS* A DIFFERENCE

ARMCO
IRON & STEEL
SHEETS
Custom Made
TO MEET YOUR NEEDS

YEARS AGO, when the stamping industry was in the woods, sheet metal was bought and used haphazardly and hopefully. If it worked—fine; if it didn't—well, take the oftentimes staggering loss and make the best of it.

"What's the difference?" a somewhat discouraged buyer once asked an Armco representative, back in those not-so-palmy days.

But there *was* a difference; and Armco went on to show it to the perplexed stamping industry. Instead of vainly trying to fit an all-purpose sheet to every job that came along, special, *individualized* sheets were created for each specialized product. Different compositions of iron or steel; hard tempers, soft tempers, tempers in between; sheets hot-rolled, cold-rolled, annealed—an endless variety of treatments and finishes were developed to make the metal form smoothly, uniformly, and profitably, whatever the requirements.

That was hard pioneering for Armco, yet the task is not done. From the automotive industry, from furniture factories and washing machine factories, from every conceivable user of metal sheets for stamping purposes, come fresh problems every day. Frankly, we do solve many of these problems in a wholly satisfying way.

And yours? It may be the hardest of all, but we will give it all the earnest thought and effort that our experienced engineers, metallurgists, and production men can apply. You can reach us through our nearest office.

ARMCO . . . . On the Air
WLW . . . . Tuesday Nights
9:00—9:30 E. S. T.

The American Rolling Mill Co.

Executive Offices: Middletown, Ohio

DISTRICT OFFICES:

Boston . Chicago . Cleveland . Detroit
Middletown . New York . Philadelphia
Pittsburgh . St. Louis . San Francisco

PIONEERS IN CONTINUOUS SHEET ROLLING

Steel Imports, Exports Rise In November to May Level

BOTH imports and exports of iron and steel products into and from the United States gained in volume in November, compared with the October total, reaching the highest level since May.

Exports totaled 56,041 gross tons in November, a gain of 14,815 tons over October. For 11 months exports have totaled 540,573 tons, which is 59.4 per cent of the volume in the comparable period of 1931. Imports increased 1231 tons to a total of 34,924 tons in November. The 11-month total of 348,892 tons is 88.3 per cent of the total for 11 months in 1931.

Exports of scrap increased to 29,184 tons in November from 10,004 tons in October, accounting for the entire gain in exports, with a margin to balance the loss in other items. Galvanized sheets exported declined from 3904 tons in October to 1408 tons in November, and tin plate from 3659 tons to 2275 tons. In most other items there was no substantial difference between the two months.

Imports of pig iron fell off sharply to 8776 tons in November, compared with 17,236 tons in October. Ferromanganese and spiegeleisen increased from 1291 tons in October to 3326 tons in November. Imports of structural shapes more than doubled, growing from 2475 tons in October to 5655 tons in November.

Imports from France more than doubled in November, from 2282 tons in October to 5249 tons in November. Germany made almost as large a percentage gain, from 3485 tons in October to 6123 tons in November. Canada sent to the United States almost exactly the same tonnage, 3088 tons in October and 3082 tons in November. Imports from Great Britain increased by a large percentage, though the actual quantity was small. In October its contribution was 438 tons and in November 1892 tons.

Canada and Japan practically doubled their shipments from the United States as compared with October, Canada taking 13,720 tons in October and 26,333 tons in November while Japan took 7272 tons in October and 13,263 tons in November. This increase was largely in scrap. Exports to the Philippine islands dropped from 5960 tons in October to 2825 tons in November. Other countries took about the same tonnage as in October.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1932		1931	
	Imports	Exports	Imports	Exports
Jan.	31,053	40,660	41,628	92,719
Feb.	26,738	40,492	28,045	91,161
March	41,031	49,927	40,402	109,324
April	36,339	58,118	47,872	101,434
May	39,751	80,477	37,176	95,046
June	34,494	52,081	37,819	75,577
July	18,005	52,558	37,190	84,465
Aug.	23,623	32,955	30,139	73,338
Sept.	29,241	36,038	30,966	69,778
Oct.	33,693	41,226	29,401	59,335
Nov.	34,924	56,041	34,658	59,556
11 mo.	348,892	540,573	395,277	911,733
Dec.	.....	.....	25,812	57,263
Total	.....	.....	421,108	968,996

ORIGIN OF NOVEMBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	13,616	36	.....	235
United Kingdom	50	1,075	.....	234
Cuba	11,000	.....	.....	.....
Soviet Russia	15,500	.....	.....	.....
Germany	.....	36	.....	79
Netherlands	.....	6,485	.....	.....
Canada	.....	101	.....	2,757
Kwantung	.....	59	.....	.....
British India	.....	984	.....	.....
Gold Coast	.....	.....	1,337	.....
France	.....	.....	.....	21
Total	40,166	8,776	1,337	3,326

	Steel ingots	Steel scrap	Steel bars	Cast iron pipe
Belgium	82	.....	2,087	50
Germany	1	.....	665	.....
Sweden	11	.....	82	.....
Canada	.....	87	.....	.....
France	.....	.....	280	.....
United Kingdom	.....	.....	32	.....
Bulgaria	.....	.....	4	.....
Total	94	87	3,150	50

IMPORTS OF IRON AND STEEL PRODUCTS INTO THE UNITED STATES

Gross Tons

Item	Nov. 1932	Oct. 1932	Nov. 1931
Pig iron	8,776	17,286	8,805
Sponge iron	5	51	.....
Ferromanganese, spiegeleisen (1)	3,326	1,299	3,770
Ferrochrome (2)	18	17	.....
Ferrosilicon (3)	.....	4	46
Other ferroalloys	.....	1	100
Scrap	87	136	933
Steel ingots, blooms, billets, etc.	94	29	1,866
Concrete bars, etc.	1,474	1,669	1,597
Hollow bar, drill steel	103	34	31
Merchant steel bars	3,150	2,114	2,950
Iron slabs	7	.....	.....
Iron bars	9	6	40
Wire rods	935	403	624
Boiler, other plate	10	32	1
Sheets, skelp, saw plate	3,693	2,313	274
Tin plate	21	10	30
Structural shapes	5,655	2,475	3,703
Sheet piling	.....	.....	.....
Rails, rail fastenings	383	119	82
Cast iron pipe, fittings	53	.....	145
Welded pipe	434	195	1,098
Other pipe	89	157	1,109
Barbed wire	1,876	949	2,072
Round iron, steel wire	102	150	202
Telephone, telegraph wire	2	.....	1
Flat wire, strip steel	131	77	39
Wire rope, strand	148	175	152
Other wire	243	109	23
Hoops and bands	2,741	2,904	4,374
Nails, tacks, staples	1,199	862	369
Bolts, nuts, rivets	33	41	92
Horse, mule shoes	22	31	5
Castings, forgings	108	45	101
Total	34,924	33,693	34,634

(1) Manganese content.
(2) Chromium content.
(3) Silicon content.

November Output of Iron, Steel in Canada Encourages

Production of steel ingots and direct steel castings in Canada in November was 37,088 gross tons, second highest month in 1932.

November output of pig iron—all basic—in Canada was 14,149 gross tons, highest since April. In 11 months output of pig iron has been 117,099 tons, against 406,176 tons a year ago. On Nov. 30 a blast furnace at Sydney, N. S., was the only active one in Canada.

November output of ferroalloys was 1544 tons, compared with 1599 tons in October.

EXPORTS OF IRON AND STEEL PRODUCTS FROM THE UNITED STATES

Gross Tons

Item	Nov. 1932	Oct. 1932	Nov. 1931
Pig iron	160	175	717
Ferromanganese and spiegeleisen	.....	2	2
Iron, steel scrap	29,184	10,004	6,158
Ingots, blooms, billets, slabs, sheet bars	31	180	4,299
Iron bars	24	35	48
Steel bars	1,106	1,040	5,590
Alloy steel bars	107	128	136
Wire rods	472	1,123	1,353
Boiler, other plates	957	663	1,407
Skelp, iron or steel	4,068	4,224	2,201
Iron sheets, galvanized	121	105	131
Steel sheets, galvanized	1,408	3,904	1,993
Steel sheets, black	2,929	2,083	5,263
Iron sheets, black	128	135	217
Hoops, bands, strip steel	1,276	1,161	1,275
Tin plate, terneplate	2,275	3,659	6,528
Water, oil, gas, other tanks, except lined, etc.	597	199	1,064
Shapes, not fabricated	1,014	704	2,789
Shapes, plate, fabricated	813	516	1,174
Metal lath	57	44	142
Frames, sashes and sheet piling	551	666	1,385
Rails	500	355	2,214
Rail fastenings	257	177	1,240
Boiler tubes, seamless and welded	450	289	335
Casing and oil-line pipe	1,279	1,281	717
Seamless black pipe, other than casing (1)	67	36	.....
Malleable-iron screwed pipe fittings	119	132	225
Cast-iron screwed pipe fittings	76	101	48
Cast-iron pressure pipe and fittings	180	1,097	182
Cast-iron soil pipe and fittings	27	70	105
Welded black and galvanized steel pipe	1,790	2,413	5,330
Welded black and galvanized wrought-iron pipe	355	83	262
Riveted pipe, fittings (1)	5	4	.....
Plain black or galvanized iron or steel wire	404	571	1,241
Barbed wire and woven-wire fencing	904	1,500	1,051
Woven-wire screen cloth	51	53	49
Wire rope	107	198	74
Insulated iron or steel wire and cable	2	5	4
Other wire and manufactures	167	109	267
Wire nails	711	365	618
Tacks	30	20	31
Other nails, staples	219	176	183
Bolts, machine screws, nuts, rivets, washers	206	199	261
Iron castings	370	650	323
Steel castings	42	44	55
Car wheels and axles	257	295	220
Horseshoes	18	20	8
Forgings	170	233	641
Total	56,041	41,226	59,556

(1) Not shown prior to 1932.

Industrial Men in the Day's News

Virgil Dustin Jordan, President, National Industrial Conference Board

—*Underwood & Underwood Studios*

AS the head of industry's forum he succeeds the late Magnus W. Alexander, with whom he was associated nine years.

HE has studied at New York City College, Columbia and Wisconsin, teaching in the latter. He once was an editor of Everybody's.

HIS writings on political, social and economic subjects are copious. He has written important books on war debts and the farm problem.

VIRGIL DUSTIN JORDAN, economist, has been elected president of the National Industrial Conference board, New York, in succession to Magnus W. Alexander, who died Sept. 10.

Born at Olean, N. Y., June 3, 1892, Mr. Jordan was graduated with Phi Beta Kappa honors from the College of the City of New York in 1912, afterward doing postgraduate work in economics at the University of Wisconsin and Columbia university. From 1912 to 1914 he was an instructor in economics at Wisconsin. Then he became an associate editor of and special writer on economic and sociological subjects for *Everybody's* magazine.

In 1920 Mr. Jordan became chief economist and editor of publications of the Conference board, for nine years being associated with the late Mr. Alexander. For the past three years he has been chief economist for the McGraw-Hill publications.

In 1928, Mr. Jordan organized and was first chairman of the Conference of Statisticians in Industry, composed of statisticians and economists of leading trade organizations. He resigned the chairmanship in 1932. More than 1000 articles in American and foreign periodicals have issued from his pen, many from 1920 to 1926 when he contributed to nearly 800 foreign newspapers a weekly article on economics, financial, political and social developments in the United States.

Books by him include "The Inter-Ally Debts and the United States" and "The Agricultural Problem in the United States." In accepting the presidency of the board, which was organized in 1916 to provide a private forum for frank discussion of economic and social problems by leading industrial executives, Mr. Jordan commented as follows:

"In the next few years American industry will face some of the most difficult problems of its history and will be compelled to make many crucial decisions which will profoundly affect its future. It is vitally important that it be prepared to deal with these problems and to make these decisions on the basis of intimate and up-to-date information about current economic conditions and tendencies here and abroad, continuous discussion and interchange of ideas among industrial executives regarding new developments in the business picture, and fundamental data upon which can be built a better understanding of the basic factors in national prosperity."

FRANK F. MARQUARD, assistant general superintendent of the Clairton steel works furnaces and by-product coke works of the Carnegie Steel Co., Pittsburgh, has been appointed general superintendent in charge of operations at the Clairton division of the company. Mr. Marquard succeeds Henry J. Davis, who retired Jan. 1 after 43 years of service with the Carnegie company.

Robert J. Tully, formerly general superintendent of the New Castle, Pa., steelworks of the Carnegie company, has been appointed assistant general superintendent at Clairton.

□ □ □

Elmer E. Gilbert, sales manager of the turbine department of the General Electric Co., Schenectady, N. Y., retired Jan. 1, after 43½ years of service with this company and the Thomson-Houston Electric Co., a predecessor. For 30 years he directed turbine sales for General Electric, beginning with the year in which the first large commercial turbine was sold to the Commonwealth Edison Co., Chicago. A graduate of Rose Polytechnic institute, Terre Haute, Ind., in 1889, he entered the Thomson-Houston company the same year as a test man at Lynn, Mass. Two years later he was transferred to the New York office, in 1892 he joined the sales staff of General Electric in New York, and advanced steadily until attaining the direction of turbine sales and becoming an expert in installation and operation as well.

□ □ □

M. J. Czarniecki, formerly manager of tubular sales of the A. M. Byers Co., Pittsburgh, has been ap-

pointed general manager of sales for the company. Mr. Czarniecki has no immediate predecessor, as the general managership of sales has been open for several years, T. L. Lewis being the last holder of the office. In announcing the promotion, H. W. Rinearson, vice president of the company, stated that the move had been necessitated by the departmentalizing of sales activities.

□ □ □

J. F. Welborn, chairman of the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., has been elected a director of the Denver Community Chest.

□ □ □

Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has been re-elected president of the Alabama Mining institute.

□ □ □

E. W. Sanders has been appointed Cleveland representative of the Poldi Steel Corp. of America, New York, with headquarters at 10465 Carnegie avenue, Cleveland.

□ □ □

Herman A. Wagner, president, Wisconsin Bridge & Iron Co., Milwaukee, has been re-elected president of the Milwaukee Employers' council. Water C. Lindemann, vice president, A. J. Lindemann-Hoverson Co., stoves and ranges, was re-elected first vice president.

□ □ □

Schuyler Merritt, for the past eight years chairman of the board of the Yale & Towne Mfg. Co., Stamford, Conn., has resigned following his election to the house of representatives at Washington.

Walter C. Allen, president of the company for 17 years, succeeds Mr. Merritt as chairman.

W. Gibson Carey Jr., vice president and treasurer, is now president, also remaining treasurer.

□ □ □

Clarence P. Walker, identified with the foundry industry since 1900 and for the past year with the American Abrasive Metals Co., Irvington, N. J., manufacturer of alloy steel safety treads, has been appointed plant manager of the company. His previous connections include the Vilter Mfg. Co., Filer & Stowell Co. and Allis-Chalmers Mfg. Co., Milwaukee, and the Hardie-Tynes Mfg. Co. and the Joubert & Goslin Machine & Foundry Co., both of Birmingham, Ala.

□ □ □

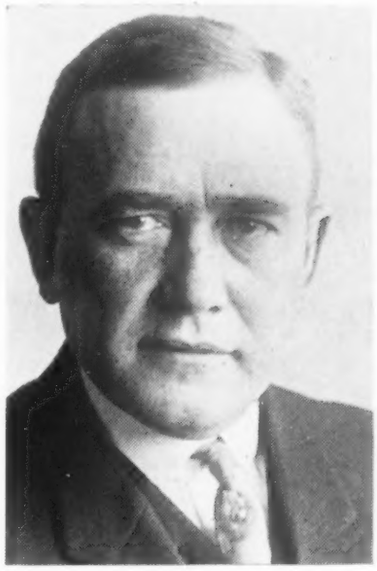
John D. Nicklis for many years prominent in the mill supply distributing field while associated with Manning, Maxwell & Moore Inc., New York, has been appointed eastern and New England sales representative of the Cleveland File Co., Cleveland. Mr. Nicklis will have offices in New

(*Pease turn to Page* 150)

Obituaries

CHARLES L. CLOSE, manager of the bureau of safety, sanitation and welfare of the United States Steel Corp. since 1911, died in Cincinnati, Dec. 26, while he and Mrs. Close were on a holiday visit to their daughter, Mrs. David F. Austin.

Born in Shelby, O., Nov. 16, 1874, Mr. Close in 1893 entered the employ of the Shelby Steel Tube Co., becoming assistant superintendent and holding that position until September, 1901, when he was made assistant superintendent of the Greenville Works of the company. In 1905 he was made superintendent, continuing until March 1, 1908, when



Charles L. Close

the Shelby company was acquired by the National Tube Co.

Shortly afterward, when National Tube organized its safety activities, he was transferred to the Pittsburgh office as chief safety inspector. On March 1, 1911, he went to New York to the post he occupied since. Mr. Close, who lived in Bernardsville, N. J., was regarded as an expert in safety. He was an organizer of the National Safety council, Chicago, served that organization as vice president and at the time of his death was a member of the executive committee.

□ □ □

Chester A. Lasell, 72, president of the Whitin Machine Works, Whitinsville, Mass., died Dec. 16.

□ □ □

Samuel G. Cornsweet, 45, president of the Cornsweet Iron Co., Cleveland, died Dec. 27, following an automobile accident.

□ □ □

Frank D. Almy, 68, president of the Almy Water Tube Boiler Co., Providence, R. I., until his retirement several years ago, died Dec. 14.

□ □ □

Thomas J. Bryson, 51, structural engineer for Walker & Weeks, architects, Cleveland, died Dec. 27. He was a native of Uniontown, Pa.

□ □ □

Morris Adler, 77, an organizer of the Tutwiler Coal, Coke & Iron Co. and the Bessemer Rolling Mills, Bessemer, Ala., died Dec. 23 at Birmingham, Ala.

□ □ □

Addison H. Tallman, 53, president of the Tallman Brass & Metal Co., Hamilton, Ont., died Dec. 24. He was associated with his father and brothers in the Hunter Foundry, which in 1918 was incorporated as the Tallman company.

□ □ □

Brig. Gen. J. Fred Pierson, 93, president of the Ramapo Foundry & Wheel Works and the Ramapo Mfg. Co., New York, died Dec. 21. He was the oldest surviving general of the Union army during the Civil war and was one of the oldest corporation presidents in the United States.

□ □ □

Frank W. Skinner, 74, construction engineer, said to have used steel rivets for the first time in bridge construction in rebuilding the old railroad suspension bridge over Niagara Falls, in 1880, died at New York, Dec. 24. He was a writer and lecturer on engineering problems, had edited technical publications, was professor of field engineering at Cornell university from 1894 to 1904, and was a member of many engineering organizations.

□ □ □

Edwin M. Herr, 72, vice chairman of the board of directors and former president of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., died in New York, Dec. 24. Born in Lancaster, Pa., his business career began as a telegrapher with the Western Union Telegraph Co., later entering the railroad field and working his way up to the division superintendency of the old Burlington & Quincy railroad at Aurora, Ill.

He joined the Westinghouse interests at the request of George Westinghouse to become general manager of the Westinghouse Air Brake Co., Wilmerding, Pa., in 1898 and was named first vice president of the Westinghouse Electric & Mfg. Co. in 1905. He was one of the receivers and general manager when the company went into a receivership in 1907, resuming the first vice presidency after successful reorganization and being elected president in 1911. Three years ago he became vice chairman of the board of directors.

Mr. Herr was a member of numerous clubs and affiliations as well as the recipient of several honorary degrees and foreign decorations. He was a director of the Westinghouse

Air Brake Co., Radio Corp. of America, and American Manufacturers' Export association, among others.

□ □ □

John J. Leahy, 40, salesman for the Standard Sanitary Mfg. Co., Pittsburgh, for the past 20 years, died at Pittsburgh, Dec. 28.

□ □ □

Frank L. Kohlhause, 71, president of the National Stamping & Electrical Works, Chicago, which company he established in 1897, died Dec. 27 in St. Petersburg, Fla.

□ □ □

Thomas L. Wickenden, 50, formerly connected with the Lackawanna Steel Co. and the Republic Iron & Steel Co. but since 1921 associated with Ettinger & Brand, Cleveland bond house, died at Cleveland, Dec. 27.

□ □ □

L. G. Gage, president of the Gage Structural Steel Co., Chicago, died Dec. 21 at the age of 80. A native of Vermont, in 1885 he entered the Chicago office of the Jones & Laughlin Steel Corp. In 1903 he went with A. Bolters & Sons, Chicago, and in 1909 organized his own company.

Weir Sees Profits Improved in 1933

CONSUMPTION of steel in 1933 may not be much larger than in 1932, but the industry has some expectation that stabilized conditions, increased efficiency and a broader attitude by buyers may improve the profits position, states E. T. Weir, chairman, National Steel Corp., Pittsburgh.

Mr. Weir believes it is not likely that the principal consumers of steel will take less in 1933 than in 1932, while there are some indications that consumption may be increased.

Meanwhile, the industry is concentrating production in its most efficient units, is modernizing to meet the demands of depreciation and obsolescence, and is stabilizing its market situation.

Since four to five tons of material must be moved to produce a ton of steel, a small increase in activity in the steel industry would substantially benefit many other industries, according to Mr. Weir.

Atlas Wins Tax Refund

A refund of more than $25,000 has been made to the Atlas Steel Corp., Dunkirk, N. Y., by the bureau of internal revenue, Washington, for overassessments of income tax as follows: Jan. 9 to Dec. 31, 1925, $2761; 1926, $15,042; 1927, $4215; and 1928, $3218.

Industrial Men in The Day's News

(*Concluded from Page* 149)

York and will operate under the company policy of creating and distributing exclusively through mill supply houses. Mr. Nicklis is a former president of the National Supply and Machinery Distributors' association.

□ □ □

H. F. Stocker, formerly associated with Hausman & Wimmer Co., Clark building, Pittsburgh, is now located at 1117 Clark building, Pittsburgh.

□ □ □

Alan Wood Smith, who has charge of roll sales for the Aetna-Standard Engineering Co., Youngstown, O., has been given complete charge of both sales and manufacture of rolls.

□ □ □

Fred Wimmer, formerly with the Hausman & Wimmer Co., Pittsburgh, is now associated with Meyer Singer, in the iron and steel scrap business, in Pittsburgh. New quarters are being taken on the twelfth floor of the Keenan building.

□ □ □

Edward L. Solomon has been named president and treasurer of the Max Solomon Co., Oliver building, Pittsburgh, iron and steel scrap, to succeed his father, the late Max Solomon.

H. A. Solomon, also a son of the late Max Solomon, has been elected vice president and secretary, and G. Fred Siemon assistant secretary of the company.

□ □ □

S. A. Smith, 1012 North Third street, Milwaukee, has been appointed Wisconsin sales representative of the All Steel Equipment Co., Aurora, Ill. He also represents the Metal Door & Trim Co., Laporte, Ind., the Sanymetal Products Co., Cleveland, and the Moeschl-Edwards Corrugating Co., Cincinnati.

□ □ □

David Ayr, formerly with the Pratt & Whitney Co., Hartford, Conn., has been elected president of the Hendey Machine Co., Torrington, Conn. He succeeds John A. Coe, Waterbury, Conn., who has been elected chairman of the board of the Hendey company.

Mr. Ayr received his early training at the Brown & Sharpe Mfg. Co., Providence, R. I. Later he was connected with the Pierce-Arrow Motor Car Co., Buffalo, after which he became general superintendent of the Gurney Ball Bearing Co., Jamestown, N. Y. During the war he was active in the manufacture of munitions in the United States and Canada, at which time he was works manager for the Russell Motor Car Co., Buffalo. He left that position to go with the Pratt & Whitney company, becoming manager of the machinery division and a member of the board.

France Honors Thomas

Under auspices of the Societe des Igenieurs Civils de France the fiftieth anniversary of the introduction into France of the basic or Thomas method of making steel was celebrated at Paris, Dec. 5. A delegation of the Iron and Steel institute of Great Britain and Albert Lebrun, president of France, participated. A wreath was laid upon the tomb of Sidney Thomas.

The Business Week In Washington

RECONSTRUCTION FINANCE CORP. has agreed to buy $500,000 worth of water plant repair bonds of Corpus Christi, Tex., to be used for repairing a dam. It is estimated that $330,000 will be expended for materials.

The R. F. C. will purchase $8000 worth of certificates of Saranac, N. Y., for replacing one-half mile of 4-inch cast iron pipe with 10-inch pipe.

If the application of the bureau of power and light, department of water and power, Los Angeles, to the R. F. C. is approved, it is estimated that $3,000,000 worth of steel towers will be purchased. This is for a $22,800,000 transmission system from the Hoover dam project on the Colorado river to Los Angeles.

□ □ □

More than 500,000 aliens who would have come into the United States during the period of the depression have been excluded because of denial of immigration visas, the secretary of state has informed President Hoover.

□ □ □

The treasury department has announced allowance of a drawback on steel ingots manufactured by the Erie Forge & Steel Co., Erie, Pa., with the use of imported nickel, imported ferromanganese and ferromanganese produced by firms under drawback regulations.

□ □ □

Senator Black, of Alabama, has introduced a bill which would make illegal the shipment in interstate commerce of any commodity made by more than five-day-a-week worker.

HORSE HEAD 99.99+% UNIFORM QUALITY ZINC

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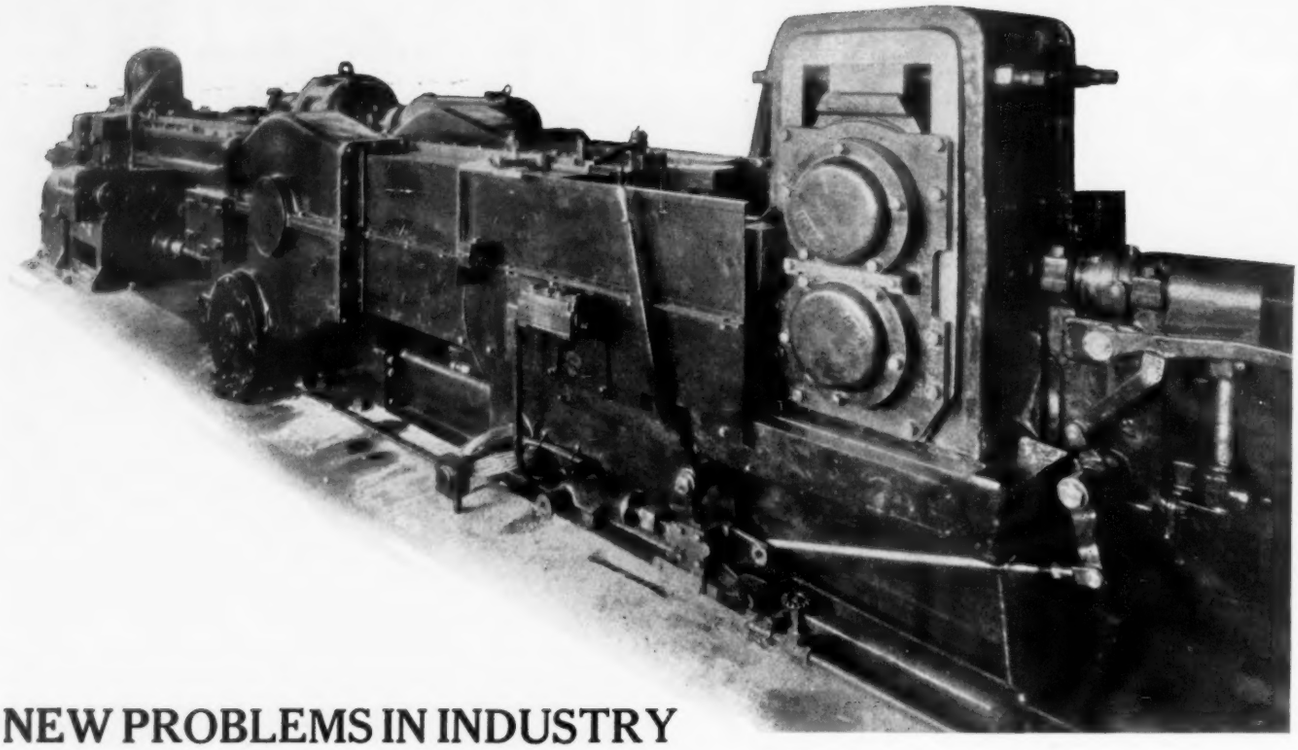

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Universal steel plate mill at the Clydesdale Iron and Steel Works of Stewarts & Lloyds Ltd. in Scotland. This mill was built by Fraser & Chambers Ltd. to Mackintosh-Hemphill design

European Market Developments in 1932 Reviewed

Reports Prepared by Staff Correspondents

Steel and Iron Domestic Prices 154

Believe Only Wise Statesmanship Will Re-Create Confidence in 1933—By Vincent Delport 155

Steel and Iron Prices for Export 156

Great Britain Puts Her House in Order—By J. A. Horton 157

Germany's Output Goes Back Several Decades—By Dr. E. H. Regensburger 159

French Comptoirs Maintain Prices Under Difficulties—By J. M. Leon 161

Italy Endeavors to Organize Her Industry—By Dr. Guido Vanzetti . 163

Belgian Works Experience Worst Year in History 164

Central Europe in Throes of Depression—By Dr. Jan Tille 166

Russian Output Up to 5,500,000 Tons 167

European Iron and Steel Domestic Prices in 1932

At Works or Furnace

British Prices in Pounds Sterling Per Gross Ton, at current rate of exchange

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
Foundry pig iron, Silicon 2.50-3.00	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6	2–18–6
Basic pig iron	2–16–0	2–16–0	2–16–0	2–16–0	2–16–0	2–16–0	2–16–0	2–14–0	2–14–0	2–14–0	2–14–0	2–14–0
Furnace coke	0–14–3	0–14–3	0–14–0	0–13–3	0–13–3	0–13–3	0–13–0	0–12–6	0–12–0	0–12–0	0–12–0	0–12–0
Billets	5– 7–6	5– 7–6	5– 7–6	5– 7–6	5– 7–6	5– 0–0	5– 0–0	5– 0–0	5– 0–0	5– 0–0	5– 0–0	5– 0–0
Standard rails	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0
Merchant bars	6–15–0	6–15–0	6–13–3	6–12–6	6–12–6	6–12–6	6–12–6	6–12–6	6–12–6	6–13–0	6–15–0	6–15–0
Shapes	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0	8–15–0
Plates, ship, bridge and tank	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0	9– 0–0
Sheets, black, 24-gage	8–10–0	8–10–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 5–0	8– 6–0	9– 5–0	9– 5–0
Sheets, galvanized, 24-gage, corrugated	9– 2–6	9–15–0	9–15–0	9–15–0	9–12–6	9–12–6	9–12–6	9–10–0	9– 6–3	10–5–0	11–5–0	11–5–0
Plain wire	8–10–0	8–10–0	8–10–0	8–10–0	8–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0
Hoops and bands	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0	9–10–0

German Prices in Reichsmarks Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry pig iron, Silicon 2.50-3.00	69	69	69	69	69	69	69	69	69	69	63	63
Basic pig iron	75.50	75.50	7.50	75.50	75.50	75.50	75.50	75.50	75.50	75.50	69.50	69.50
Furnace coke	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25
Billets	99.45	99.45	96.45	96.45	96.45	96.45	96.45	96.45	96.45	96.45	96.45	96.45
Standard rails	127	127	127	127	127	127	127	127	127	127	127	127
Merchant bars	115	115	110	110	110	110	110	110	110	110	110	110
Shapes	112	112	107	107	107	107	107	107	107	107	107	107
Plates, 5 millimeters	132	132	127	127	127	127	127	127	127	127	127	127
Sheets, black, 1 to 3 millimeters, basis	144	144	144	144	144	144	144	144	144	144	144	144
Sheets, galvanized, 24-gage, corrugated	390	370	370	370	370	370	370	370	370	370	370	370
Plain wire	178	178	178	178	178	178	178	178	178	178	178	178
Hoops and bands	133	133	127	127	127	127	127	127	127	127	127	127

French Prices in French Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry pig iron, Silicon 2.50-3.00	235	230	230	225	220	215	210	200	200	195	200	205
Basic bessemer pig iron	228	210	200	200	200	185	175	175	170	170	170	170
Furnace coke	145	129	129	124	124	124	124	124	124	124	124	124
Billets	305	330	340	370	370	370	370	370	370	370	370	370
Standard rails	697	697	697	697	697	697	697	697	697	697	697	697
Merchant bars	500	500	500	515	530	530	530	530	530	530	530	530
Shapes	550	550	550	550	550	550	550	550	550	550	550	550
Plates, 5 millimeters	650	650	650	650	650	650	650	650	650	650	650	650
Sheets, black, 2 millimeters	730	700	725	775	800	800	800	800	800	800	800	800
Sheets, galvanized, 0.6-millim., corrugated	1350	1350	1500	1500	1500	1570	1570	1570	1570	1570	1570	1570
Plain wire	970	970	970	970	1130	1130	1130	1130	1130	1130	1130	1130
Hoops and bands	560	560	560	575	565	580	580	580	580	580	580	580

Belgian Prices in Belgian Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry pig iron, Silicon 2.50-3.00	370	360	325	325	325	315	305	295	290	300	300	300
Basic bessemer pig iron	340	325	295	295	290	270	260	260	270	270	270	270
Furnace coke	160	160	160	145	145	135	120	110	110	110	110	110
Billets	425	420	410	395	380	365	360	355	365	380	390	395
Standard rails	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150
Merchant bars	500	495	465	440	425	410	405	415	440	490	540	540
Shapes	495	490	465	440	420	410	405	410	420	465	500	500
Plates, 5 millimeters	595	590	560	545	535	525	515	515	540	575	615	600
Sheets, black, 1 to 3 millimeters, basis	690	690	690	690	690	675	665	665	670	675	680	700
Galvanized sheets, corrugated, 0.5-milli.	1700	1595	1500	1500	1500	1370	1370	1305	1260	1350	1440	1440
Plain wire	1500	1500	1500	1500	1500	1500	1500	1500	1300	1300	1300	1300
Hoops and bands	710	675	675	675	675	675	675	675	660	650	660	675

BELIEVE ONLY WISE STATESMANSHIP WILL RE-CREATE CONFIDENCE IN 1933

BY VINCENT DELPORT
European Manager, STEEL

"THE worst year in history." This conclusion sums up the survey of the situation in all European steel-producing countries. This statement, as measured by results, is only too true. Admittedly, the business trend at the end of 1932 had improved, but no prospect of definite or early revival can be entertained until the major international problems still begging for a solution are settled. Leaders of thought in every nation must face the facts and exert their full influence to induce the mutual concessions which are necessary to bring the world back to normal conditions, with a corresponding measure of prosperity.

Never before have steel export prices reached as unprofitable a level as that which prevailed during the summer of 1932. At that time, orders consistently were taken at a loss in order to avoid complete shutdowns. Competition was fierce and unabated, many firms going to extreme ends to keep a hold on their markets or to open up new ones. Notwithstanding the low prices, the combined action of wide local disturbances and of the world's reduced purchasing power resulted in a wholesale decline of export business in all countries.

Britain Holds Her Export Trade

In Great Britain, the sterling export price level remained comparatively stable. Aided, partly by the depreciation of the pound, partly by a vigorous attempt to preserve her own markets, Britain suffered only a small reduction of iron and steel export trade as compared with 1931; but one must remember that, of recent years, 1931 was probably the worst that Great Britain experienced, and one that already saw a very severe constriction of British foreign trade.

The Ottawa agreements did not have time to yield their effects on British export trade by the end of 1932. On the other hand, the confirmation of the new tariff policy on foreign imports of iron and steel did have a decisive effect, particularly from October, and at the end of the year the outlook generally was decidedly better.

The trend of Continental export prices is of interest, especially as all attempts to control prices internationally broke down. Even the European Steel Entente completely ceased to exert its influence early in the year. The only international syndicates to operate normally were the old-established International Rail Makers' association and the International Wire Rod syndicate.

Prices dropped consistently from the beginning of the year until midsummer, when they reached the lowest level on record. About September, one could begin to detect timid signs of renewed interest from various territories. This period marked the end of falling markets, with the exception of one or two commodities. Prices then began to rise, slowly at first, and then somewhat suddenly toward the middle of November. In the course of three months the export price of merchant bars had increased by 30 per cent and had returned to the level of November, 1931.

Law of Supply and Demand Revives

It is worthy of notice that this rise in prices occurred without any artificial or compulsory means of control. The steelmakers, forced by circumstances, had reduced their output, and on their own initiative gradually increased their quotations when inquiries and contracts increased in volume. There was a minimum of concerted action, of a very loose nature, and producers let orders expand and prices rise before materially increasing their output; in other words, the inevitable law of supply and demand came back into its own.

At the end of November, the rise in export prices came to a halt. Consumers required breathing space, and markets were enabled to stabilize temporarily at a more remunerative level. The upward trend, however, had the appearance of being genuine, and the market position at the end of the year was certainly more healthy than at the start. With the exception of Belgium and Luxemburg, domestic prices were kept fairly stable; they were generally more profitable than export prices.

There is a definite feeling that 1932 has seen the worst of the depression. Under wise leadership, and on the condition that existing international complications can be removed, 1933 should be marked by a gradual and healthy improvement.

European Iron and Steel Export Prices in 1932

F.o.b. Ports of Shipment

British Prices in Pounds Sterling Per Gross Ton

at current rate of exchange

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3 Middlesbrough	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6	2-18-6
Basic, Middlesbrough	2-16-0	2-16-0	2-16-0	2-16-0	2-16-0	2-16-0	2-16-0	2-14-0	2-14-0	2-14-0	2-14-0	2-14-0
Hematite, East Coast	3- 5-0	3- 4-3	3- 3-6	3- 3-6	3- 3-6	3- 3-0	3- 2-6	3- 0-6	3- 0-0	2-19-6	2-19-0	2-19-0
SEMIFINISHED STEEL												
Billets	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	4-17-6	4-17-6	4-17-6	4-17-6	4-17-6	4-17-6	4-17-6
Wire rods	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0	7-10-0
FINISHED STEEL												
Standard rails	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0
Merchant bars	6- 5-0	6- 5-0	6- 5-0	6- 5-0	6- 5-0	6- 2-6	6- 2-6	6- 2-6	6- 2-6	6- 2-6	6- 3-9	6- 5-0
Structural shapes	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6	7- 7-6
Plates, ship, bridge and tank	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0	8-15-0
Sheets, black, 24-gage	8-15-0	8-15-0	8- 5-0	8- 0-0	8- 0-0	8- 0-0	8- 0-0	8- 0-0	8- 0-0	8- 0-0	8- 5-0	8- 5-0
Sheets, galvanized, 24-gage, corrugated	9- 5-0	9-12-6	9-15-0	9-15-0	9-12-6	9-12-6	9-11-3	9-10-0	9- 7-6	10- 0-0	10- 0-0	10- 0-0
Hoops and bands	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0	7-15-0
Plain wire, base	8-10-0	8-10-0	8-10-0	8-10-0	8-10-0	9-10-0	9-10-0	9-10-0	9-10-0	9-10-0	9-10-0	9-10-0
Galvanized wire, base	12-10-0	12-10-0	12-10-0	12- 8-3	12- 0-0	11-10-0	11-10-0	11-10-0	11-10-0	11-10-0	11-10-0	11-10-0
Wire nails, base	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0	11- 0-0
Tinplate, base box 108 pounds	0-14-6	0-15-0	0-16-0	0-15-6	0-15-0	0-15-0	0-15-0	0-15-0	0-15-3	0-16-0	0-16-0	0-16-0
Ferromanganese†	$73	$73	$73	$73	$73	$73	$68	$68	$68	$68	$68	$68

†Delivered Atlantic Seaboard duty-paid.

German Prices in Gold Pounds Per Metric Ton

F.o.b. Rotterdam or Northern Sea Ports

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, Silicon 2.50-3.00	2- 3-0	2- 2-0	2- 2-0	2- 2-0	2- 2-0	2- 0-0	2- 0-0	2- 0-0	2- 0-0	2- 0-0	2- 0-0	2- 0-0
SEMIFINISHED STEEL												
Billets	2- 9-0	2- 7-0	2- 7-0	2- 5-0	2- 4-0	2- 0-0	2- 0-0	1-19-0	1-19-0	2- 2-0	2- 4-0	2- 3-0
Wire rods	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0	5- 5-0
FINISHED STEEL												
Standard rails	5-17-6	5-17-6	5-17-6	5-17-6	5-17-6	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0
Merchant bars	2-14-0	2-14-0	2-12-0	2- 6-0	2- 5-0	2- 3-6	2- 3-6	2- 3-0	2-10-0	2-13-0	2-19-6	3- 0-0
Structural shapes	2-12-6	2-11-3	2-10-0	2- 7-0	2- 5-0	2- 1-0	2- 1-0	2- 0-0	2- 3-0	2- 5-0	2-10-0	2- 6-0
Plates, 5 millimeters	3- 5-0	3- 4-0	3- 4-0	3- 0-0	3- 0-0	2-14-0	2-14-0	2-13-0	2-17-6	3- 0-0	3- 5-0	3- 5-0
Sheets, black, 24-gage	7-12-6	7-10-0	7-10-0	6-10-0	6-10-0	6- 0-0	6- 0-0	6- 0-0	6- 0-0	6- 0-0	6- 0-0	6- 0-0
Sheets, galvanized, 24-gage, corrugated	10- 0-0	10- 0-0	10- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0	9- 0-0
Hoops and bands	3-12-0	3-15-0	3-10-0	3- 7-6	3- 7-6	3- 5-0	3- 5-0	3- 5-0	3- 0-0	3- 5-0	3-10-0	3-12-6
Plain wire, base	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6
Galvanized wire, base	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0	6-10-0
Wire nails, base	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6

French Prices in Gold Pounds Sterling Per Metric Ton

F.o.b. Channel Ports or Antwerp

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, Silicon 2.50-3.00	2- 0-0	1-17-6	1-17-6	1-17-6	1-17-6	1-16-0	1-15-0	1-14-0	1-13-0	1-13-0	1-14-0	1-14-0
Basic bessemer	1-18-0	1-15-0	1-14-0	1-14-0	1-11-0	1-10-0	1- 9-0	1- 8-0	1- 7-0	1- 7-0	1- 6-0	1- 4-0
SEMIFINISHED STEEL												
Billets	2- 8-6	2- 7-9	2- 5-6	2- 2-6	2- 1-6	1-19-6	1-18-0	1-18-6	1-19-0	2- 0-0	2- 3-0	2- 3-0
Wire rods	5- 2-6	5- 2-6	5- 2-6	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0
FINISHED STEEL												
Standard rails	5-17-6	5-17-6	5-17-6	5-17-6	5-17-6	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0
Merchant bars	2-14-0	2-12-9	2- 8-6	2- 5-0	2- 3-6	2- 3-6	2- 3-0	2- 3-9	2- 6-6	2-13-0	2-18-0	2-18-0
Structural shapes	2-11-6	2-10-3	2- 7-6	2- 4-0	2- 3-0	2- 1-6	2- 0-0	2- 0-0	2- 1-6	2- 3-9	2- 5-6	2- 5-0
Plates, 5 millimeters	3- 5-0	3- 2-6	2-18-6	2-15-6	2-14-6	2-13-0	2-12-6	2-12-0	2-15-0	3- 1-6	3- 4-6	3- 5-0
Sheets, black, 0.5-millimeter	7-11-3	7- 8-9	7- 5-0	7- 3-9	7- 0-0	6-17-6	6-12-6	5- 6-0	5- 9-0	5-15-0	5-16-0	5-17-6
Sheets, galvanized, 24-gage, corrugated	7-12-6	7- 0-0	7- 0-0	7- 2-6	6-17-6	6-17-6	6-15-0	6-12-6	6-12-6	6-16-3	6-15-0	6-12-6
Hoops and bands	3-11-3	3-10-0	3- 8-9	3- 7-6	3- 6-0	3- 6-0	3- 6-0	3- 2-6	3- 2-6	3- 3-9	3-10-0	3-11-0
Plain wire, base	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6
Galvanized wire, base	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0	6- 7-0
Wire nails, base	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0

Belgian Prices in Gold Pounds Sterling Per Metric Ton

F.o.b. Antwerp

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, Silicon 2.50-3.00	2- 0-0	1-17-6	1-17-6	1-17-6	1-17-6	1-16-0	1-15-0	1-14-0	1-13-0	1-13-0	1-14-0	1-14-0
Basic bessemer	1-18-0	1-15-0	1-14-0	1-14-0	1-11-0	1-10-0	1- 9-0	1- 8-0	1- 7-0	1- 7-0	1- 6-0	1- 4-0
SEMIFINISHED STEEL												
Billets	2- 7-6	2- 7-0	2- 5-0	2- 2-6	2- 0-0	1-19-0	1-18-0	1-18-6	1-19-0	2- 1-0	2- 3-0	2- 3-0
Wire rods	5- 2-6	5- 2-6	5- 2-6	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0	4-10-0
FINISHED STEEL												
Standard rails	5-17-6	5-17-6	5-17-6	5-17-6	5-17-6	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0
Merchant bars	2-13-6	2-12-6	2- 8-6	2- 5-0	2- 4-0	2- 3-6	2- 3-0	2- 4-0	2- 7-0	2-13-0	2-18-0	2-18-0
Structural shapes	2-11-6	2-10-0	2- 7-0	2- 4-0	2- 2-0	2- 0-6	2- 1-6	2- 0-6	2- 1-6	2- 3-0	2- 5-6	2- 5-0
Plates, 5 millimeters	3- 4-6	3- 2-6	2-18-0	2-16-0	2-14-6	2-13-6	2-12-6	2-12-6	2-15-0	3- 1-3	3- 4-6	3- 5-0
Sheets, black, 0-5-millimeter	6-17-0	6- 7-6	5-15-0	5-15-0	5- 9-0	5-12-6	5-12-6	5-10-0	5-10-0	5-16-3	5-16-0	5-17-6
Sheets, galvanized, 24-gage, corrugated	7-12-6	7- 0-0	7- 0-0	7- 2-6	6-17-6	6-17-6	6-15-0	6-12-6	6-12-6	6-16-3	6-15-0	6-12-6
Hoops and bands	3-11-3	3-10-0	3- 8-9	3- 7-6	3- 6-0	3- 6-0	3- 5-0	3- 3-9	3- 3-9	3- 3-9	3-10-9	3-11-0
Plain wire, base	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6	5- 7-6
Galvanized wire, base	6- 7-0	6 -7-0	6 -7-0	6 -7-0	6- 7-0	6- 7-0	6 -7-0	6 -7-0	6 -7-0	6 -7-0	6 -7-0	6 -7-0
Wire nails, base	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0	5-10-0

Great Britain Puts Her House in Order

BY J. A. HORTON
British Correspondent, STEEL

THE fundamental change in the fiscal policy of Britain seemed to have little effect upon the trend of trade in the early months of 1932. The announcement in February of a new system to be developed on the basis of a general import duty of 10 per cent did something to encourage the industry, but nobody supposed that any real benefit could be expected from that.

April 26, a move calculated to have far-reaching effects was made, namely, that for the 10 per cent there was substituted a protective tariff of 33 1/3 per cent on all foreign semifinished steel and heavy steel manufactures. This step was, undoubtedly, a blow to Continental manufacturers. Nevertheless, they had heard so much of the proposed British tariff beforehand that they had sent in enormous quantities of material. In effect, the market was flooded with foreign goods to an extent never anticipated.

Markets Regained Late in Year

These imports served to clog the wheels of British industry for a considerable period after increasing the duty. Moreover, it was clear three months later, in July, that imports had not ceased, although there had been a diminution, due partly to general trade stagnation. In the late autumn, however, a gradual change attributable to the depreciation of sterling and consequent withdrawal of Continental firms from the market. In November it seemed that British makers were gradually getting the upper hand, and in many lines it was already possible to buy British products cheaper.

That, briefly, is the record of 1932 so far as Continental competition is concerned. The leveling-up of the position gave fresh hope to British industrialists. Support for the optimism was also to be found in the decision to renew the duties for two years as from Oct. 25. With this order the imports duty advisory committee added that continuation of the duties was "subject to satisfactory progress being made in the preparation of a scheme of reorganization and in putting the approved scheme into force."

The reorganization mentioned has reference to the national committee for the iron and steel trade which was set up in June. This committee, which consists of members of the trade from all parts of Britain, issued its first report in October, when it strongly urged retention of the duties as essential to basic recovery.

Turning to statistics of production, the record of steel shows a fluctuating output from January to October. In January, the output was 429,700 gross tons; this jumped to 480,600 tons in February, a figure never reached again. The lowest point touched was 361,500 tons in the holiday month of August. The output for the year can be estimated at 5,240,000 gross tons, against 5,179,000 tons in 1931, actually a slight increase.

August Was Low Month

At the end of October, only 59 furnaces were producing pig iron. The output was the lowest in August, with 259,400 tons. At the other end of the scale, output in March was 335,600 tons, the best of the year. The estimate for the year is 3,600,000 gross tons, compared with 3,758,000 tons in 1931, a slight decrease.

One of the most striking features of Britain's external trading was the sharp return of Continental imports in October, when they were 60 per cent higher than those of September; they were larger, indeed, than those of any month since February. Low water mark was touched in August, when 105,072 tons of foreign steel were admitted. The figure leaped to 163,190 tons in October. An interesting comparison is afforded by taking the results over the ten months ended Oct. 31, and then those of the same period in 1931. In each case, imports and exports show a substantial drop, particularly in regard to imports.

Exports for 1932 totaled 1,554,418 gross tons, against 1,609,658 tons in the corresponding period of 1931. Imports amounted to 1,461,603 gross tons, compared with 2,205,694 tons, a very significant drop, largely attributable to import duties.

Empire Preferences of Value

Agreements reached at Ottawa are regarded as likely to have beneficial effects upon the British steel trade. Increased preferences granted by Australia and Canada will, undoubtedly, assist British makers in securing a larger share of business from these dominions. New Zealand, South Africa and India guarantee not to lower the existing British preferences, while Newfoundland, subject to satisfactory agreements in regard to the imports of Wabana iron ore into Britain, guarantees a preference of 10 per cent over foreign goods in respect of steel products from Britain. The greatest gain to British steelmakers will probably accrue from the Canadian agreement, because the British share of the Canadian iron and steel importation has been in recent years only about one-seventh of that secured by the United States.

The Steel Manufacturers' association maintained a firm hold on prices. In July, 1932, however, billet makers announced a scale of prices which gave advantage to buyers who could take heavy tonnages. The minimum was £4 17s 6d for soft billets for lots of 500 tons or over.

British Business Progress in 1932

(Gross tons 000 omitted)

	PRODUCTION				IMPORTS			EXPORTS		
Monthly ave.	Coal	Pig iron and ferro-alloys	No. fur-*naces in blast	Steel ingots and castings	Iron ore	Pig iron and ferro-alloys	Steel†	Furnace Coke	Pig iron and ferro-alloys	Steel†
1913	23,951	855	338	639	603	18.0	168	...	93.7	320
1929	21,492	632	162	803	474	12.8	222	138	45.5	320
1930	20,323	516	76	610	345	26.0	216	129	26.4	237
1931	18,346	313	70	432	177	25.5	212	118	16.9	148
1932										
Jan.	18,673	330	76	430	156	13.2	157	182	13.4	154
Feb.	18,517	324	71	481	146	23.2	229	106	10.9	129
March	18,789	336	72	463	203	21.8	108	90	8.6	158
April	18,368	317	69	433	138	10.0	135	91	22.4	158
May	17,002	315	69	417	162	20.0	124	57	7.1	144
June	16,758	311	69	459	165	12.1	114	70	13.8	133
July	15,034	293	56	438	134	8.8	110	90	5.7	153
Aug.	15,297	259	57	361	101	10.2	95	143	6.4	150
Sept.	16,102	260	59	430	103	8.5	99	146	6.7	120
Oct.	17,937	276	59	439	168	7.8	155	147	7.6	153
Mo. ave.	17,248	302	59	435	148	13.6	133	112	10.3	145

*Average for 1913; on last day of year or month for subsequent figures. †Includes iron castings, but scrap excluded.

the price gradually increasing to £5 7s 6d in inverse ratio to quantity. There was no alteration in pig iron prices during the year. A graduated scale of prices for galvanized sheets was also introduced for the home market as an inducement to business.

The slump in shipbuilding was complete. In the last quarter of 1931 and the first two quarters of 1932 there were practically no orders in the Clyde yards. Constructional engineering was likewise under cloud. Firms in the Midlands which have carried out some of the biggest constructional projects in existence suffered severely, and at times were practically without business. Similarly, activity in the building of railroad cars was almost at a standstill.

The prospects for the future are more encouraging than for some time. Signs are forthcoming that the world-wide economic depression is lifting. In Britain itself there was undeniable evidence of trade revival during the closing months of 1932. The automobile industry, especially, maintained active production, with a consequent demand for all classes of metals. On Tees-side the signs of revival were to be found in increased shipments of iron and steel and in the blowing of furnaces. Inquiry for steel broadened, particularly from Russia and the Far East.

In South Wales, the prospects also improved. The reopening of steelworks, tin plate mills and blast furnaces has commenced, and makers are further encouraged by the drop in supplies from Belgium. Midland manufacturers have already secured steel orders which would have gone abroad but for the increase in Continental prices.

Imported Steel Is Burden

The existence of Continental stocks in Britain, however, is the stumbling block to a real renewal of negotiations with British steelmakers. It was stated in October that an estimate of a six months' supply of imported steel was putting it comparatively low. Pig iron producers are handicapped by stocks of their own making. For months they have been making more iron than the market could absorb, and the accumulation at the furnaces has been heavy. The whole question of relighting idle plant depends on the rate of progress made in liquidating these stocks.

It is reasonable to suppose that 1933 will see the growth of world-wide demand and a consequent diminuation of the burden of stocks. Meanwhile, Britain has been putting her house in order with the aid of the national committee for the reorganization of the steel trade. A national policy is being evolved, and the committee is progressively working toward a national solution of its many problems.

Permanent Basis Is Sought

Reorganizing of plant and financial structure is going on steadily and determination to build a large plant in Northhamptonshire by Stewarts & Lloyds to make use of the large iron deposits there, supplanting ore supplies formerly drawn from the Continent, shows the intent of British steelmakers to meet the requirements of the government in return for the tariff protection, designed to hold back foreign competition until the home industry should be able to compete on more even terms. Effects of this effort already are being felt in greater confidence and in stronger de termination to meet requirements.

In the words of the first report issued by this committee: "It is contemplated that the existing organizations will, with growing experience, become consolidated and established on a permanent basis, so as to ensure that the industry is governed in the future by a national policy directed to increase its competitive power in the export markets of the world and to co-operate with its consuming industries both in home and foreign markets."

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Germany's Output Goes Back Several Decades

BY DR. E. H. REGENSBURGER
German Correspondent, STEEL

THE words of Dr. Peter Kloeckner, one of the leaders of the Rhenish-Westphalian heavy industry, according to whom 1932 was the most catastrophic year since the eighties of the last century, give a true picture of the situation in Germany in 1932.

Throughout the year, the economic life of the country suffered severely from the repercussions of foreign and domestic politics, finance, and economic policies, from growing unemployment, low prices, shrinkage of purchasing power at home and abroad, and from exchange restrictions. When in July, the Lausanne agreement was signed, however, the basis for an improvement of sentiment and business during the latter part of the year was established.

The crisis is clearly reflected by the fact that Germany's production of pig iron was smaller than in any year since 1891, its output of raw steel smaller than since 1898, and its manufacture of rolled products smaller than since 1896. Compared with 1931, the production of pig iron, estimated at 3,800,000 metric tons, was reduced by 37 per cent, and that of raw steel, estimated at 5,655,000 tons, by 31 per cent.

Business of Combines Shrinks

Sales of the leading combines diminished accordingly: for the United Steel Works Co. from 842,000,000 marks to 522,600,000, and for the Good Hope combine from 366,600,000 marks to 231,000,000. None of the important producers was in position to pay a dividend for the past year, most of them closing the year with a serious loss. United Steel Works Co., which controls about half of the German heavy industrial output, will probably have to undergo financial reorganization. The government, which has gradually taken control of most sections of economic life, acquired control of the Gelsenkirchen Mining Co., which itself controls the United Steel Works Co.

German exports of iron and steel, including scrap, were heavily hit by the reduced purchasing power of foreign countries, by tariff walls and exchange restrictions, which increased throughout the year, and also by depreciation of the pound sterling. During the first ten months exports aggregated 2,083,004 metric tons, compared with 3,609,116 tons during the corresponding period of 1931 and 4,097,522 tons in the same period of 1930.

It must be mentioned, however, that exports would have shown a still heavier decline if the Russians had not ordered during the year about 500,000 metric tons of rolled products, and if some contracts had not been effected with Turkey and South America, which could only be financed on a long-term basis with the aid of the German government. Despite an increase in export prices in October, prices available during most of the year caused producers to suffer heavy losses, so that their interest in export trade was reduced to the mere necessity of procuring work for their mills.

Domestic Sales at Low Mark

Domestic sales also fell off substantially. In September, for instance, domestic deliveries of A-products totaled only 28,100 metric tons, against 74,000 tons in September, 1931, while those of merchant bars declined from 41,860 tons to 37,800 tons. From that time, a slight improvement occurred, in accordance with the better feeling registered during the latter part of the year. The domestic consumption of steel in 1931 had already fallen to 70 kilograms per capita, compared with 124 kilograms in 1930 and 243 kilograms in 1927, thus reflecting such a low state of investment that it was almost unthinkable that it could last for long.

Early in the year domestic prices had been reduced by about 10 per cent, in accordance with the prescriptions of the government, and in order to compete with foreign makers entering the German market, an additional rebate of 3 marks per ton of semifinished products and of 5 marks for other rolled products was granted to consumers undertaking to use only German steel. The new prices, which were partly below the prewar level, were not further modified, although they continue to be much too high in comparison with the world market level. Imports of iron and steel during the first ten months declined to 617,063 metric tons from 824,251 tons in the corresponding period of 1931, but owing to the reduced consumption, these tonnages sometimes pressed heavily on the German market.

Wage Reductions Are Sharp

In order to make up for losses, wages were substantially reduced, and finally producers were granted tax redemption bonds for 40 per cent of the taxes paid by them. Nevertheless, their situation remains most unsatisfactory. Domestic sales of the United Steel Works Co. during the year ended Sept. 31, 1932, fell from 472,700,000 marks to 319,300,000, or by 32 per cent, while their total sales decreased by 38 per cent.

The introduction of short-time work was still enforced by the government, and the Good Hope Co. reports that in the past year the working time at its rolling trains was reduced to an average of three days per week. It was necessary to dis-

German Business Progress in 1932

(Metric tons 000 omitted)

	PRODUCTION*				IMPORTS‡		EXPORTS‡		
Mo. ave.	Coke	Pig iron and ferro-alloys	No. fur-† naces in blast	Steel ingots and castings	Pig iron and ferro-alloys	Steel §	Coke	Pig iron and ferro-alloys	Steel §
1913	2,639	910	204	993	11	41	534	71	470
1929	3,213	1,117	95	1,354	14.8	137	888	36	448
1930	2,705	808	63	962	14.3	94	664	19	381
1931	1,892	505	46	691	9.9	68	528	16	345
1932									
Jan.	1,635	358	48	400	4.3	47	452	5.0	187
Feb.	1,573	330	42	448	4.8	58	406	2.8	179
March	1,609	314	41	435	3.8	56	389	3.9	172
April	1,456	336	40	521	3.7	64	329	4.3	177
May	1,593	381	41	624	6.3	55	306	4.9	265
June	1,572	310	38	506	6.1	59	436	7.9	320
July	1,583	294	36	429	4.2	56	455	5.9	192
Aug.	1,513	268	40	416	4.8	56	468	5.7	155
Sept.	1,492	273	32	392	4.6	57	480	8.4	173
Oct.	1,678	333	39	522	6.3	61	508	12.3	203
Mo. ave.	1,570	320	39	470	4.9	57	423	6.1	202

*Figures for 1913 are for Germany in her present boundaries. †On last day of year or month. ‡Figures for 1913 are for pre-war boundaries and include Luxemburg. §Includes iron castings and scrap.

miss many workers, the staff of the Good Hope Co. being reduced from 43,956 on June 30, 1931, to 31,092 by June 30, 1932, that of the Kloeckner works from 19,103 to 14,662, and that of the United Steel Works Co. from 97,100 to 81,800.

Few changes occurred in the various organizations controlling the German market. Early in the year, a conflict broke out between the steelmasters and the working-up concerns relative to the export rebate to be granted to the latter. The producers stated that they were not in a position to maintain the rebate at previous levels. This conflict was smoothed over, but a fresh quarrel broke out between producers and manufacturers, the latter claiming that the producers, contrary to mutual agreement, were unduly increasing their influence in the working-up industry. Finally, the independent working-up concerns established a new association. Effective May 1, 1932, the differences among the thin-sheet makers became settled, and a renewal of the Thin Sheet association until 1940 was agreed upon. The Pig Iron association was prolonged until Dec. 31, 1934.

The pig iron market was dull throughout the year. Prices had been reduced in December, 1931, by about 10 per cent, and again in November, 1932, and an additional rebate of 6 marks per metric ton was granted, owing to the growing English competition in the German market, thus bringing the domestic price for foundry No. 3 pig iron down to 63 marks. From September the output gradually increased, although stocks amounting to 893,000 metric tons existed on Oct. 1. At the end of October, 39 furnaces were in blast, against 47 on Oct. 31, 1931.

Export Markets Narrowed

Exports of pig iron during the first ten months declined to 55,826 metric tons, compared with 156,985 tons in the corresponding period of 1931. Imports, on the other hand, shrank from 102,510 metric tons to 48,108 tons. The scrap market was lifeless, although exports increased by about 33 per cent, whereas imports continued to decline. An additional output of 240,000 metric tons of scrap during the next 18 months is expected to result from the dismantling of ships, which is to be executed with the aid of public funds. Imports of iron ores, which already in 1931 had been almost halved, were again cut in 1932 by more than 50 per cent, as it proved to be impossible for the steelmasters to add further to their stocks. The Swedish mines had to agree to a further postponement of shipments on their contracts.

Viewing the year 1933, it is expected that a further decline below the level of trade reached in the summer of 1932 will scarcely be possible. Whether or not the hopes recently expressed by the various leaders of the industry will materialize depends mainly upon the settlement of the great international problems to be discussed at the world economic conference which is to take place in the spring of 1933.

Government Aid Is Timely

Much aid is given the industry by the German government, assumption of control of the United Steel Works Co., hitherto referred to, having steadied the situation at a time when help was needed. When conditions have settled it will be possible to make an adjustment of this situation in a way that will not have a bad effect on other companies. A burden still hangs over the market by virtue of the long-time contracts for ore with Swedish producers, which have been deferred by agreement but remain in force for future deliveries when needs again reach something like normal proportions. Whether Russian buying will be continued in the volume of the past depends largely on the success of the plans of the Soviets for increasing production of iron and steel.

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French Comptoirs Maintain Prices Under Difficulties

BY J. M. LEON
French Correspondent, STEEL

NOTHING at the end of the year 1931 justified the hope that an improvement in economic conditions would cause a revival of industry generally early in 1932. More particularly with regard to the iron and steel industries, the outlets for export trade shrank considerably; and the possibilities of doing business in the domestic market were limited by restricted demand on the part of consumers, and also on account of large tonnages of foreign products passing the French border, especially from Belgium.

As a result of this situation, the output of steel ingots and castings in France during 1932 showed a substantial drop in comparison with the tonnage produced in 1931. The tonnage in 1932 can be estimated at 5,515,000 metric tons, compared with 7,822,000 tons in 1931, a reduction of 29 per cent. With regard to pig iron, the figures are still more striking, the output in 1932 being 5,435,000 metric tons, against 8,199,000 tons in 1931, a reduction of 33.5 per cent.

Syndicates Are Handicapped

To a large extent, domestic market conditions in France are governed by the control of a number of comptoirs or syndicates; but during the past two or three years these organizations have experienced a somewhat troubled existence. The necessity was felt to tighten the organization of these syndicates, to control more strictly the output of steel products and fixing of prices with a view to meeting the pressing problems with which the industry was faced. The very existence of the comptoirs was menaced by disunity among the members, and also by the fact that a number of dissentient works remained outside.

Such was the position at the end of 1931, when the leaders of the industry decided to unite their efforts to meet these contingencies. As a result, a convention was signed Jan. 22, 1932, with a view to strengthening the position of the comptoirs and this was accepted by the large majority of steelworks. One of the main features of this convention was to establish a court of arbitration, which has power, definitely and without further recourse, to settle any dispute arising from dissatisfaction on the part of comptoir-members with comptoir policies and decisions.

Comptoirs are to be established for a minimum period of three years, and so far as possible for a period equal to that of any corresponding international syndicate. The member-works undertake not to manufacture any product which is controlled by a comptoir if the said works did not manufacture that product at the time when the comptoir was organized. In principle, the determination of the quotas for raw steel and for the various products controlled by comptoirs is made on the basis of the deliveries effected during 1929 and 1930.

Adjustments Are Made

These principles having been adopted, the constitution of a number of comptoirs followed, and the first to start operating were the semifinished steel and the structural steel comptoir, which commenced March 1. Previously, the merchant bar syndicate had been renewed, Jan. 1, 1932, in a form similar to that already obtaining, a few changes having been introduced respecting the position of rerollers who were not themselves steelmakers and who, although no longer members of the syndicate, were committed to quote the prices fixed by the syndicate.

The plate and sheet comptoir includes the large majority of the plate and sheet mills, including those manufacturing special products such as electric sheets and automobile sheets. The wire rod comptoir continued to operate normally, and a comptoir was also established for cold-rolled steel.

May 1, a comptoir was organized to control hoops and bands and skelp, but this syndicate was established on the condition that an international syndicate controlling the same products would be formed by Nov. 1. An international syndicate not having been formed by that date, one of the member-companies of the French syndicate resigned its membership, and the syndicate was dissolved.

Situation Is Uncertain

At the time, there was some anxiety lest the whole structure of the syndicate organizations should be disrupted, especially as one large concern had accepted to join the merchant bar syndicate on the condition that the hoop and band syndicate would function. If this firm did withdraw from the merchant bar syndicate, it is likely that this comptoir and the semifinished steel and structural steel syndicates would come to an end. The position at the end of the year was, therefore, uncertain.

It was not found possible to reconstitute the pig iron syndicate. On the other hand, the hematite pig iron syndicate continued to function although only in a perfunctory manner, since it could be really effective only if the phosphorus pig iron syndicate were extant.

Notwithstanding the difficulties in the path of the comptoirs, they caused domestic prices during the year to remain remarkably stable. At the beginning of 1932 the prices of semifinished steel were abnormally low; Feb. 1, when it became known that the semifinished steel comptoir

French Business Progress in 1932

(Metric tons 000 omitted)

	PRODUCTION*					IMPORTS**@			EXPORTS @	
Mo. ave.	Iron ore	Coke†	Pig iron and ferro-alloys	No. furnaces in blast	‡Steel ingots and castings	Coke	Pig iron and ferro-alloys	Steel §	Pig iron and ferro-alloys	Steel §
1913	3,588	336	756	190	581	256	4.2	10	9	51
1929	4,227	397	864	154	808	454	4.0	14	48	281
1930	4,048	421	836	137	787	380	14.0	21	45	273
1931	3,211	377	683	90	652	283	7.4	20	36	255
1932										
Jan.	2,473	300	490	83	469	192	4.0	10	16	182
Feb.	2,397	275	458	81	463	176	5.0	14	16	217
March	2,464	297	471	78	464	189	3.0	22	18	183
April	2,321	268	460	79	457	160	7.0	19	13	187
May	2,270	270	459	79	444	172	3.0	13	18	176
June	2,289	259	452	79	468	179	2.0	12	20	184
July	2,137	266	455	81	465	154	2.0	13	17	160
Aug.	2,190	272	456	82	473	148	2.0	13	14	155
Sept.	2,211	264	445	81	455	146	5.0	8	12	168
Oct.	2,238	274	457	81	467	148	4.0	11	19	209
Mo. ave.	2,299	275	460	81	462	166	3.7	13.5	16.3	182

*Production for 1913 is for France in her present boundaries. †Coke production at the coal mines. In addition, the iron and steel works produce about 3,500,000 tons annually. ‡On last day of year or month. §Includes ingots, semifinished steel, all rolled products, forgings and scrap. **Since 1930, imports include tonnages to be re-exported after fabrication. @Import and export figures are inclusive of the Saar district.

was going to be formed, the price increased, and March 1, when the comptoir came into existence, the price was fixed at 370 francs ($14.45) per ton, Thionville parity, for 2-inch billets.

The basis price of structural steel remained fixed by the comptoir at 550 francs ($21.50) throughout the year. The basis price of wire rod was 685 francs ($26.75) up to April, and from that time until the end of the year it remained at 710 francs ($27.75). Merchant bars were quoted at 500 francs ($19.60) up to May 1, and from then on at 530 francs ($20.75).

While prices were thus officially fixed by the comptoirs, sometime after the beginning of the year it was discovered that considerable Belgian rolled products found their way into France, notwithstanding the tariff duty. They profited by the low freights obtaining on French waterways, which enabled these Belgian products to be delivered practically all over the country as far as Lyon. In order to meet this competition, the comptoirs authorized their members to make concessions on their prices, until the situation became so urgent that the government issued a decree restricting imports of foreign products to a small fixed tonnage each month, and this action in some cases was practically equal to prohibition of imports.

Another difficulty in the organization of the steel market was the position with respect to warehouses and jobbers handling merchant steel. Following protracted negotiations, an agreement was arrived at between the merchant bar syndicate and the warehouses which went some way to regulate the position. There still remains to be settled the question of direct sales by independent rerollers, who are able to offer their products at a low price.

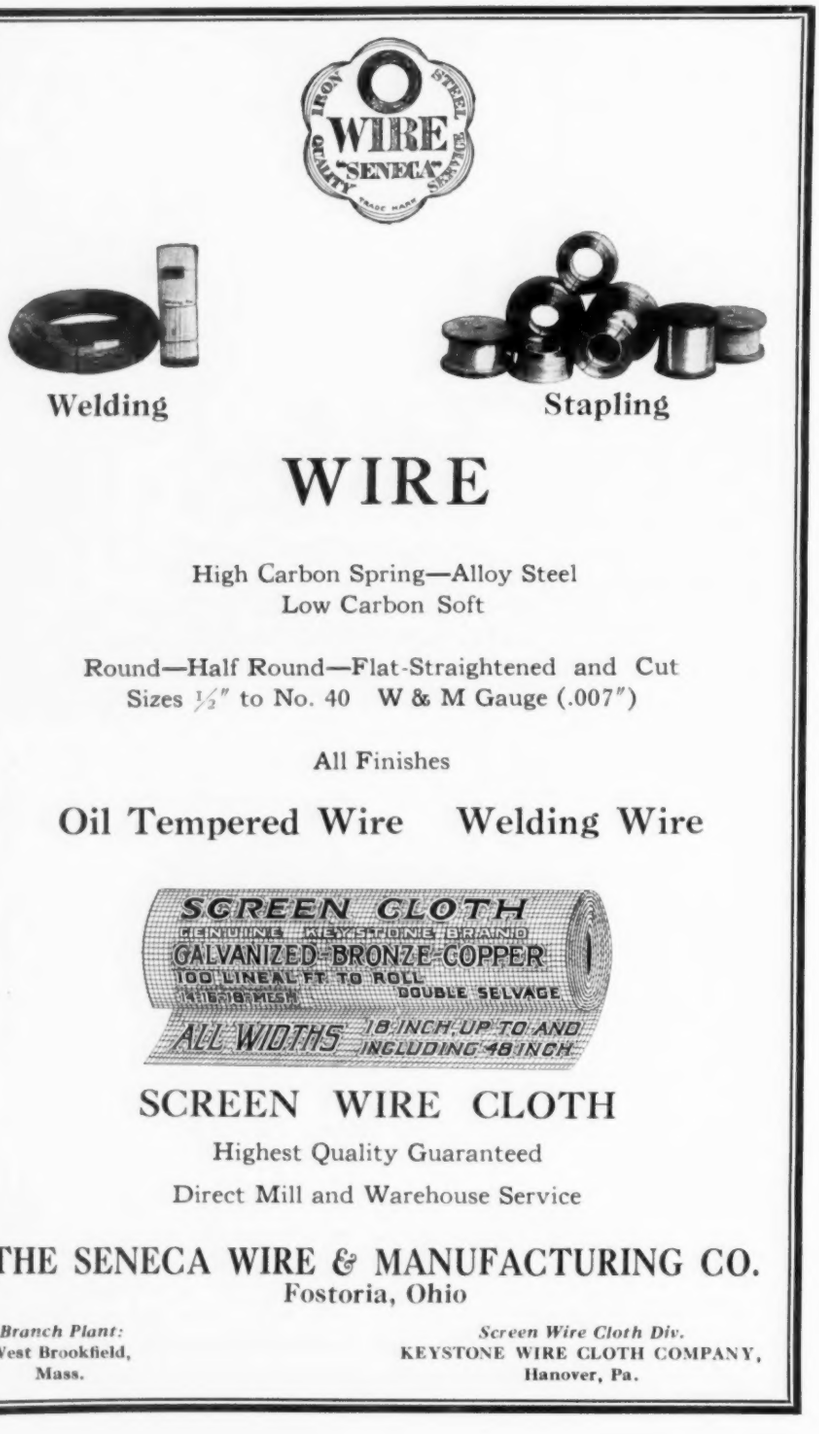
French export trade decreased in 1932 by about one-third in comparison with that of 1931. In 1931, total exports of iron and steel were 3,986,000 metric tons, including scrap. For 1932, the tonnage exported can be estimated at 2,700,000 tons. Prices were governed by the level prevailing for Belgian and Luxemburg steel and were definitely unremunerative, merchant bars having been sold in August as low as £2 2s gold, ($10.21) per metric ton f.o.b. port of shipment, and 2-inch billets at £1 17s 6d, gold, ($9.13). The new tariff policy of Great Britain exerted a detrimental effect on French exports, but during most of the year a number of French works were able to maintain a current of business with established customers, notwithstanding the duties.

Tariffs To Be Adjusted

In October, the various industrial groups were approached by the French government with a request to assist in the revision of tariffs, in connection with negotiations that were taking place with Germany. As a result of the difference between the production costs of the French, Belgian and German works, it is expected that a request will be made for an increase in tariff duties; and in view of the exceptional period of crisis which still prevails, it is also claimed that the policy of import restrictions should continue for some time.

Inasmuch as France held a much better industrial position than other European countries until late in 1931, it continued on a better basis than others through 1932. The burden of unemployment, while present, was not as great a clog as on Germany and England. Much of the labor displaced by narrowing production was drawn from other countries and the workers when rendered idle were repatriated and the burden thus shifted. Close control by comptoirs and immediate co-operation by the government served to cushion the effects of much untoward influence exerted by events. In this way, ill effects were opposed at the outset and effects minimized.

As the year 1932 drew to a close, sentiment improved; and while there was no definite revival of the domestic market, the prospects for the immediate future appeared to be brighter.



Italy Endeavors To Organize Her Industry

BY DR. GUIDO VANZETTI
Special Correspondent, STEEL

REDUCTION in domestic consumption in Italy and persistence of the world economic crisis caused Italian iron and steel production to contract substantially in 1932, but this reduction of output is comparatively not so considerable as the contraction applying to world production as a whole, this being due to the fact that the Italian iron and steel output is almost totally consumed at home.

The estimated output of steel in Italy in 1932 was about 95 per cent of the 1931 output, and 66 per cent of the record output of 1929. Estimated world production was only about 71 per cent of the 1931 tonnage, and 41 per cent of the 1929 record tonnage.

The total output capacity of the Italian iron and steel works is 800,000 metric tons of pig iron and 3,000,000 tons of steel. The maximum output reached in 1929 was 2,142,000 tons of steel, or 72 per cent of the total capacity, and 678,000 tons of pig iron, or 85 per cent of total capacity. It was estimated that the output of steel for 1932 would attain 1,385,000 metric tons, or 45½ per cent of capacity, and that of pig iron, 485,000 tons, or 60 per cent of capacity. The output of rolled products was also reduced. The output of ferroalloys in 1932 is estimated at 28,000 tons, compared with 32,100 tons in 1931, 43,700 tons in 1930, and 51,800 tons in 1929, the output for 1932 being about 54 per cent of that of 1929.

Scrap Supply Up, Prices Down

The decrease in production of steel has naturally caused a contraction in consumption of scrap; therefore, a large amount of this material was available and scrap prices fell considerably, and consequently there was no difficulty in obtaining supplies. Imports of iron and steel scrap from foreign countries had reached 612,995 metric tons in 1931; they amounted to 252,601 tons in the first half of 1932, against 284,809 tons in the corresponding period of 1931. During the first six months of 1932, imports of iron and steel products were below normal. Imports of pig iron and ferroalloys were 22,906 metric tons, compared with 49,633 tons in the corresponding period of 1931, and imports of finished products were 82,860 tons and 85,410 tons respectively.

The price of rolled steel products, as fixed by the Italian iron and steel union, dropped during 1932 about 8 per cent from the prices fixed at the end of 1931. In October, however, prices were raised, and at the end of the year they were about 4.4 per cent lower than at the end of 1931.

In 1931, the Italian iron and steel union had not completely succeeded in controlling the national output of rolled steel. Therefore, the government endeavored to create a new organization for the national iron and steel industry, and eventually a compulsory consortium was formed

(*Please Turn to Page* 165)

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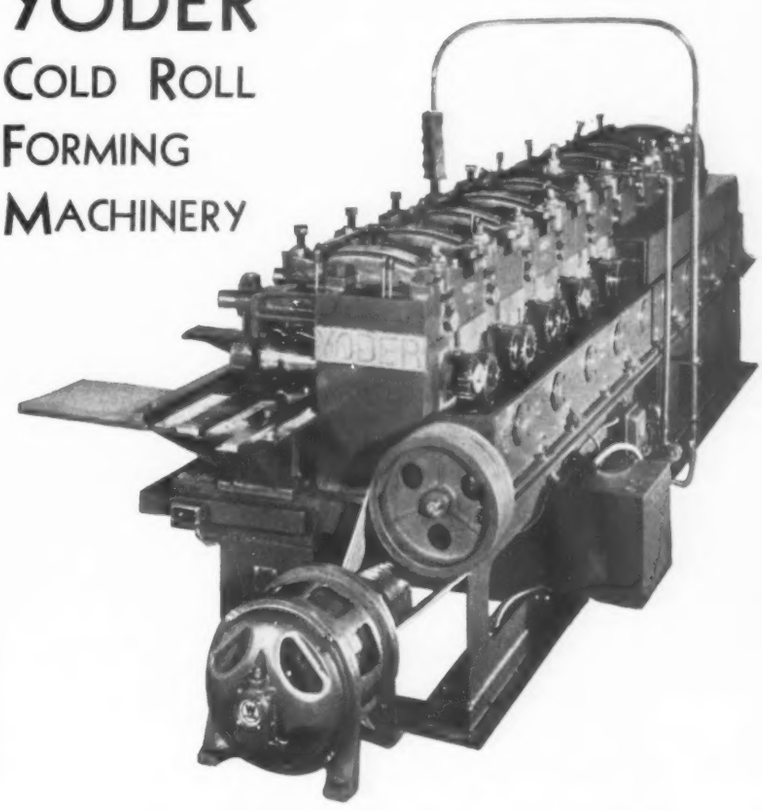

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Belgian Works Experience Worst Year in History

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THE year 1932 was one of the worst in the history of the Belgian iron and steel industry. In view of limited possibilities of the Belgian domestic market compared with its capacity of production it is necessary for that country to export by far the larger part of its output, and the world crisis, which has restricted the buying power of most nations, forced Belgian steel producers to look out for those markets which were the least affected by the crisis, in order to find an outlet for its products.

A special effort was made to take a hold on the French market. Although this territory is protected by a high duty, it is found possible for Belgian exporters to sell steel commodities in France at prices higher than those obtaining in other world markets, thanks to the cheapness of water transportation. However, possibilities of exploiting this market were eventually curtailed by measures taken by the French government to limit drastically the tonnage of foreign products entering France.

Tariffs Close Foreign Markets

Dating from March, Belgium found it extremely difficult to export steel products, and a large number of works had to curtail their output, while some of them actually shut down blast furnaces and closed their rolling mills. Gradually, the markets in which Belgian products had been more or less predominant became closed, particularly with respect to Great Britain, owing to the tariff against foreign goods; the Far East; Argentine; Brazil and other South American countries.

A small current of business was continued with Portugal and Spain; but, on the other hand, trade with Greece, especially in regard to wire products, was completely suspended, owing to the impossibility of obtaining sufficient guarantees for payment. Furthermore, certain overseas countries, such as Japan, have not only reduced imports, but have also begun to export worked-up products to Europe, particularly to those countries where domestic prices have been maintained at a high level, such as Germany.

Bank Rivalry Is Harmful

During the greater part of the year, negotiations were conducted between steelmakers of the various countries with a view to forming international selling syndicates, but it was impossible to find a common ground for fixing quotas. With regard to Belgium in particular, the question of international syndicates is rendered all the more difficult by the rivalry between the banking concerns which control the most important section of the iron and steel and heavy industries.

A logical solution would be for each works to restrict its production on its own initiative in proportion to possible consumption; but owing to the very fact that negotiations were being conducted, a number of large works made it a point to produce their maximum tonnage, in order to increase their chances of securing a high quota. The estimated output of steel ingots and castings in 1932 was 2,790,000 metric tons, or 9.5 per cent less than in 1931, and the production of pig iron was 2,765,000 tons, or 13 per cent less than in 1931.

As a result of this over-production, prices dropped to record low levels. Basic bessemer 2-inch billets, which in January were sold at gold £2 8s ($11.65), dropped to £1 17s 6d ($9.15) in July. Beams dropped from £2 11s ($12.40) to £1 19s ($9.45), and merchant bars from £2 14s ($13.10) to £2 1s 6d ($10.10), while 3-millimeter sheets fell from £3 7s 6d ($16.35) to £2 15s ($13.35). As a result, notwithstanding the strong organization of the Belgian iron and steel industry, the productivity of the Belgian workers, and reductions in wages, the losses sustained by the works became considerable.

Toward October, a loose agreement was made between the larger producers, by which they undertook to refrain from accepting business at exceptionally low prices. This action, accompanied by a certain amount of speculation, resulted in an increase of prices, which induced consumers in nonproducing countries to place some orders; but, on the other hand, this rise in gold prices was largely responsible for closing the British market, especially as at the same time the pound sterling further depreciated.

Wage Cuts Mitigate Situation

The situation at the end of the year still was serious. The intensive protective policy of practically every country shows the necessity for international co-operation, to prevent a catastrophe in the steel industry, of which the capacity of production, spread over the world, exceeds the possibilities of consumption, particularly in view of the fact that certain non-producing countries are erecting steel plant. However, Belgium still enjoys a privileged position on export markets, owing to important reduction in wages that were effected in 1932.

If 1925 is taken as a basis, retail prices in November, 1929, increased by 68 per cent, while wages had increased by 96 per cent. During the first two years of the stabilization of the Belgian franc, when there was a certain amount of prosperity, the works were producing to capacity, and there was a heavy demand for labor, with the result that the increase in retail prices was slower than the increase in salaries; but since 1929, the cost of living and wages have dropped consistently and adjusted themselves, and consequently it can be stated that since 1929 wages have dropped by about 25 per cent.

The small number of international

Belgian and Luxemburg Business Progress in 1932

(Metric tons 000 omitted)

		PRODUCTION				IMPORTS		EXPORTS	
		Belgium		Luxemburg		Belgium & Luxemburg			
Mo. ave.	Coke	Pig iron and ferro-alloys	Steel ingots and castings	Pig iron and ferro-alloys	Steel ingots and castings	Pig iron	Steel‡	Pig iron	Steel‡
1913	294	207	206	212	98	48†	26†	1.4†	130†
1929	499	341	344	242	225	56	37	10.0	395
1930	447	283	282	206	189	33	28	9.6	343
1931	411	269	260	171	169	25	30	5.8	316
1932									
Jan.	407	247	242	150	146	17	16	2.2	262
Feb.	374	244	247	153	156	13	21	2.8	311
March	409	249	250	151	153	15	18	1.5	251
April	388	245	252	159	161	12	16	2.0	314
May	386	247	243	160	161	13	13	3.3	279
June	371	235	234	157	162	19	15	2.8	298
July	327	174	174	160	160	16	14	5.9	267
Aug.	341	217	222	168	167	16	11	2.9	270
Sept.	345	219	225	170	169	16	12	2.8	260
Oct.	367	225	233	178	173	...	...	...	...
Mo. ave.	371	230	232	161	161	15	15	2.9	279

†Belgium only. ‡Includes iron castings and scrap.

organizations that were in existence before 1932, and in which Belgium plays a prominent part, operated normally. The International Rail Makers' association continued to distribute orders among the member-countries. The wire rod syndicate maintained its stability, but met with some difficulties owing to the varying situations of the works belonging to those countries which are members of the syndicate.

The International Wire Export Co. functioned without interrruption, and the imposed prices were respected. The Franco-Belgo-Luxemburg comptoir for foundry pig iron regulated the sales of this commodity, particularly with regard to consumption in Belgium.

Generally speaking, 1932 was particularly unsatisfactory for the Belgian steel industry, and no definite international control organization on a wide scale was arrived at. The Belgian works have sustained heavy losses, and if a serious improvement does not soon make itself felt, the situation will become extremely grave.

Italy Endeavors To Organize Her Industry

(Concluded from Page 163)

among the producers of rolled steel. A compulsory syndicate was also formed to control the market for wire products, as owing to previous disastrous competition, certain wire products were sold at a price lower than that quoted for wire rod. The syndicate for rolled steel and the wire products syndicate were constituted at the end of December, 1931, for a period of six months, and their life was then extended until Feb. 28, 1933. The problem of industrial organization, therefore, remains important and urgent. Syndicates were also organized for marketing certain special products, such as tubes, plates and sheets, tin plate, electric sheets.

There remains the necessity for creating a durable organization that will definitely benefit the iron and steel industry. Toward the close of 1931 the ministry of corporations appointed a committee with a view to investigating conditions in the various branches of the industry and to formulate concrete proposals with a view to obtaining a more rational organization of the industry. The committee was due to report not later than Dec. 31, 1932, and at the close of the year it was hoped that the results of the work of this committee would bring about an improvement in the iron and steel industry from the point of view of its general interests. On the whole Italy has maintained a somewhat better position than most European countries, and is well situated to make a steady gain when conditions mend.

Continental Steel Mills Suffer Deep Losses

Stockholders of Societe Anonyme John Cockerill, one of the leading iron and steel producers in Belgium, were told in the report of the board of directors that the concern has suffered from the industrial crisis which has spread over the whole world, and, consequently, results for the year ending June 30, 1932, showed a loss of 30,066,276 Belgian francs ($832,000), compared with a profit of 15,302,305 francs ($434,000) in the preceding year. The loss for the year under review was covered partly by transfer of 22,000,000 francs ($610,000) from a special reserve fund and partly by the carry-forward of the previous year, 2,200,162 francs ($61,000).

The value of sales of iron and steel products by the Vereinigte Stahlwerke, A. G., the Ruhr steel trust, during the year ending Sept. 30, 1932, amounted to 522,590,000 Reichsmarks, compared with 849,110,000 Reichsmarks in the previous year. Of this amount 319,330,000 Reichsmarks were for the domestic market and 302,260,000 Reichsmarks for export trade.

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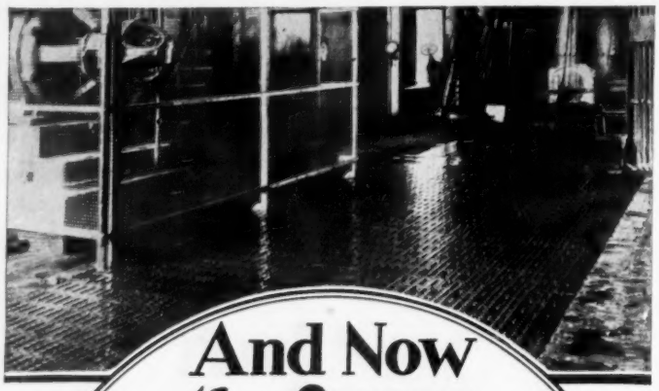

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Central Europe In Depression

BY DR. JAN TILLE
Special Correspondent, STEEL

THE steady fall in the output of iron and steel which had begun at the end of 1931 continued in all the countries of Central Europe in 1932. During the year, prices remained stable, but the restricted demand was limited to the most pressing needs of the moment in the home market, while export trade suffered a substantial decrease.

In Central Europe, the two principal steel-producing countries are Czecho-Slovakia and Poland. In both countries the steelworks are equipped with up-to-date plant. Both manufacture pig iron, raw steel and most finished products. Both have excess output capacity available for export; and in recent years both have found their principal export markets in Russia.

The output of raw steel in Czecho-Slovakia in 1932, estimated at 705,000 metric tons, was about 47 per cent of that of 1931, and the production of pig iron, estimated at 465,000 tons, was no more than 41 per cent of the previous year's output.

Improvement Appears in August

Activities diminished consistently from the beginning of the year up to July. From August on, signs of improvement began to appear. There was a slight increase in iron and steel output and certain engineering firms took back workers who had previously been discharged. Export trade, however, continued unsatisfactory, and no definite revival was noticeable as the year came to an end, although the outlook had somewhat improved.

Up to the end of the year, all expenditure was reduced to a minimum, both in private industry and in the state-owned works, as, for instance, the state railroads. During the year, Czecho-Slovakia's exports fell to a record low figure and hardly exceeded 11 per cent of the total deliveries effected by the works, whereas in 1931 the Czech works exported 46 per cent of their total output; as production was so much reduced during the year, the actual volume of exports was only about 10 per cent of the tonnage exported in 1931. Exports to Russia, Czecho-Slovakia's principal market, practically ceased, having fallen from nearly 65 per cent of total exports

in 1931 to only about 12 per cent of the greatly reduced total of exports of 1932.

Poland likewise suffered considerable reduction of activities in her iron and steel industry, in spite of having secured comparatively large orders from Russia. The production of raw steel and pig iron in Poland in 1932 fell to about 50 per cent of the preceding year's output.

Following the downward trend which had started at the beginning of the year, conditions showed a marked improvement as from June, when work was commenced on the rolling of bars, sheets and boiler plates ordered by Russia. These orders amounted to about 70,000 metric tons and deliveries were to start July 1 and to be extended over a period of five months. Notwithstanding the additional activity afforded the works by these contracts, the monthly output of steel from June onward remained well below the mark reached in the corresponding period of 1931, and total exports were still below the previous year's figure.

Austrian Slump Starts Late

It is interesting to note in this connection that by the end of October, Russia had ordered the following tonnages of rolled material: From Germany, about 240,000 metric tons; from Poland, about 70,000 tons; from Great Britain and Spain, about 30,000 tons.

In Austria, the output of steel in 1932 also fell off, but in the case of that country, the downward trend started somewhat later in the year. The output figures for the first three months were approximately the same as for the corresponding period of 1931; but in the later part of the year the Austrian works were not operating at more than 35 per cent of their actual productive capacity.

The output in Hungary did not cease to shrink from one end of the year to the other and for 1932 production will be only about 75 per cent of that of 1931, in spite of the fact that in 1931 the output had already been substantially reduced in comparison with that of the preceding year.

Russian Output Up To 5,500,000 Tons

PRODUCTION of steel ingots and castings and of pig iron in the USSR in 1932, with November and December estimated, was about 5,500,000 metric tons for each.

Actual figures on ingots and castings for the first ten months from official Soviet sources are 4,878,300 tons or 11.1 per cent greater than

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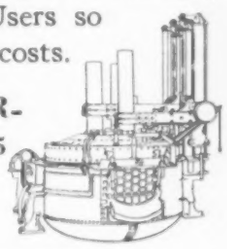

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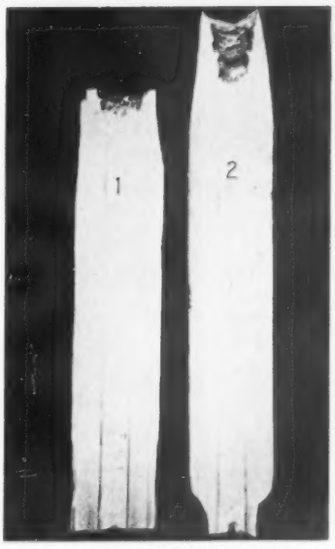

(1) Is treated with LIQUITOL A SPECIAL, the fluid metal is only poured to half of the head. The formation of the hole is such that the ingot is quite solid. The savings in 16 of these ingots is 1 ingot. This is only used for refined steel, that is to say, tool steel, cutting steel, and special steels of high quality.

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Working on the theory that secondary piping is caused by occluded gases, it follows that if the hot-top is kept open longer gases have a better chance to escape.

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in the corresponding period of 1931.

In the first ten months, output of pig iron is placed by Soviet authorities at 5,122,700 tons or 28.3 per cent greater than in the corresponding period of 1931.

Also, for ten months, production of rolled steel was 3,506,100 tons, up 10.6 per cent.

Plans of Soviet authorities were to increase capacity of steel ingots from 5,350,000 tons in 1931 to 9,450,000 tons in 1932. The program in pig iron was to put capacity up from 5,000,000 tons in 1931 to 9,000,000 tons in 1932.

Blooming Mills Completed

The Russian expansion program in iron and steel for 1932 was impressive, with $927,000,000 in capital investments contemplated, a major item of which was for the completion of additional blast furnaces scheduled to start operations in 1932. Reports at the end of ten months pointed to substantial progress.

The first two blooming mills to be built by the Soviet were installed at the Makayevka and Kamenskoye steel plants. In addition, four new blooming mills were set up, respectively, at the Magnitogorsk, Stalinsk, Noginsk and Zlatoust properties. The Magnitogorsk blooming mill alone is said to have a capacity of 900,000 metric tons a year.

Incidentally, two additional mills of similar size are to be installed. A number of rolling mills were set up and at the Stalinsk plant a 650,000-ton rail mill was scheduled to go into operation during the last quarter. Construction of the first vanadium plant in the Soviet Union was begun at Kerch in August. All is a part of the Soviet's second 5-year program.

Increased production was reflected in decreased imports. During the first nine months imports of iron and steel amounted to 608,720 metric tons, as compared with 846,487 metric tons in the corresponding period of 1931. Sheets, amounting to approximately 240,000 metric tons, were the principal item brought in.

Manganese Ore Exports Shrink

Exports were negligible, iron and steel products amounting to 3733 metric tons during the 9-month period, against 6147 tons. Scrap exports were 6007 metric tons, against 11,486 tons.

One of the world's largest producers of manganese ore, Russia exported in 1932 about half of the amount shipped in 1931. According to figures for the first nine months, 297,695 tons were shipped compared with 552,397 tons in the first three quarters of 1931. This also compares with 741,701 tons for all 1931 and 641,978 during 1930.